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THE ANILINE COLOR
DYESTUFF AND CHEMICAL CONDITIONS
FROM
AUGUST 1st, 1914 TO APRIL 1st, 1917
COMPILED BY
I. F. STONE

JE SUIS CE QUI A ÉTÉ
CE QUI EST ET CE QUI SERA
ET NUL MORTEL N'A ENCORE LEVÉ
LE VOILE QUI ME COUVRE

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The
Aniline Color, Dyestuff and Chemical Conditions

from
August 1st, 1914,
to
April 1st, 1917.

A series of Addresses and Articles
Compiled by:

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PREFACE

In compliance with the request of many of my friends among the chemical and other scientific societies, as well as manufacturers and others interested in the development of the coal tar products, aniline colors, and chemical industry in the United States, particularly since the beginning of the European War, about August 1st, 1914, I am publishing this number of addresses I have made and articles I have written on these subjects since the war started, and finishing with the situation at the present date, April 1st, 1917.

This does not include all of the addresses and articles in list mentioned at the beginning, as many of them are more or less repetitions, so I have included only those which seem to come in sequence and follow the situation from the beginning.

I am including in this book a report of a committee appointed October 9th, 1914, by the American Chemical Society (New York Section), of which committee I was a member, on the chemical and dyestuff situation, which committee reported November 6th, 1914. Also addresses by Dr. D. W. Jayne, made November 20th, 1914, Mr. J. F. Schoellkopf, made October 22nd, 1915, Dr. W. Beckers, made November 23rd, 1916, an article written by Dr. T. H. Norton, under date of February 5, 1917, and an article written by Dr. B. C. Hesse under date of June 24th, 1915, all of which are pertinent to the situation and in line with my own addresses and articles on the subject, so that this book will give a very complete history of the beginning and development of the chemical and dyestuff industries in the United States from the time of the present European War to the present time, and will be particularly interesting as a great development has been accomplished, the progress of which can be followed from these addresses and articles.

I therefore hope that this book will be of service to those societies, universities, libraries, etc., who wish a book of reference on these subjects, which will be found very useful in connection with these industries, and particularly interesting in years to come, after the present abnormal conditions are over and the United States will find it necessary to again compete with the world in the manufacture of these products.

It is with some reluctance that I include in this book a photograph of myself, and the only reason of my doing so is the repeated request of my friends, that they would like this book as a souvenir of the present European War, and my photograph included as one of the workers in the task of establishing an American industry in the dyestuff and chemical line.

I submit this book with the greatest of pleasure, and with many thanks for the expressions of interest from those who have suggested the compilation of these addresses and articles.

Very sincerely,

I. F. Stone.

April 1st, 1917.

National Aniline & Chemical Co.

Works

Schoellkopf, Hartford & Hanna Co.

(American Aniline Colors)

Buffalo

New York, September 1, 1914.

To the Consumers of Aniline Dyes:

Owing to the war conditions now prevailing in Europe and the impossibility for the present at least of bringing over any colors from Germany, the question of a supply for consumers is a very serious matter, and it is a grave question as to whether or not conditions will change in a short enough time to allow colors to be brought over in time for the wants of consumers after the two or three months' supply which is now in this country has been exhausted.

As representative American manufacturers we have been approached by numerous consumers with the inquiry as to whether or not we will be able to supply them with colors if they are unable to obtain supplies from European firms in the near future, also if we will be able and willing to extend our works so as to produce enough colors to supply American consumers in case the war is protracted and it is impossible for them to secure colors from European firms for an indefinite period.

We will take this means of publicly answering these inquiries by saying that we will be in a position to supply a general line of aniline dyes comprising acid colors for wool and silk, direct dyeing colors for cotton, basic colors for paper, leather, etc., and Nigrosines, to the limit of our capacity, irrespective of European conditions, that is to say, instead of being dependent upon Europe for raw materials as has been generally supposed, we are preparing to manufacture these raw materials ourselves, so insuring a regular supply of the finished colors with which to supply our customers. On alizarine colors, as agents of the British Alizarine Company of London, we will be able to supply certain amounts of these products depending on how much the British Alizarine Company are able to give us, shipping conditions, etc.; definite information regarding which we have not received from the British Alizarine Company at this writing.

The manufacture of the raw materials to produce the colors above mentioned will, however, necessitate a considerable advance in the price of some colors, owing to the increased cost of manufacturing them in this country as compared with Europe, as they cannot be manufactured in this country under normal conditions as cheaply as they can in Europe. The United States can produce an ample supply of the raw materials such as benzole, toluol, naphthaline, etc., which are the basic products from which these intermediate products are manufactured, so that we can be absolutely independent of Europe if the increased cost of manufacturing the intermediate products can be overcome through the assistance of the United States Government in giving us a proper protection in tariff to equalize the increased cost of manufacturing between the United States and Europe; therefore the question of increasing the capacity of our works and the possible establishment of other plants for the manufacture of aniline dyes is solely dependent on this condition. Some thirty years ago there were started in the United States some ten plants for the manufacture of aniline dyes, and had they had proper support in the way of tariff protection from the United States Government, the business would have developed so that American manufacturers would have been able to supply the whole demands of the United States, and consumers would not have found themselves in their present unpleasant situation of being unable to secure colors for their needs, and the number of aniline color manufacturers would not have been reduced to but four as at present, and these four limited to the manufacture of only a few colors, which on account of certain favorable conditions they are able to manufacture successfully in this country in competition with Europe. Consumers themselves are, however, largely to blame for this situation in that they have as a rule supported foreign manufacturers in their fights to keep down the rate of duty on colors whenever the tariff question has been before the people, their reason being their belief that with low duties they could secure a cheaper and more abundant supply of colors from Europe than if a higher duty were named and the business left in the hands of American manufacturers to develop.

The error of this reasoning is now apparent, and not only that, it is our opinion that even with a higher tariff and the consequent larger production of these products by American manufacturers, the average cost to consumers would not be materially increased, for the reason that while it is true that certain colors are sold very cheaply in this country due to European competition, other colors are sold at very high prices by European manufacturers where there is no American competition, so that the average price is much higher than it appears to be from superficial observation.

We think this will dispose of the much asked question as to whether or not aniline colors can be produced successfully in the United States, in that it can now be answered in the affirmative providing we have the proper support of the American consumers and of the United States Government, and with the assurance of such support, those who are associated in the production of raw materials, intermediate materials, and the finished products, are prepared to produce the necessary amount of money to establish the industry on a large scale, and the probability of this assurance is now being investigated.

With regard to the question of whether there is experience and chemical knowledge enough in this country to produce aniline dyes successfully, we will say for ourselves, that in spite of the difficulty in producing colors in competition

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with Europe, it is a fact that our factory in Buffalo, established in 1880, has developed steadily until its production has reached large proportions, and necessitated the investment of upward of one and one-half million dollars, this development, however, being due to our success in making a few colors which fortunately could be produced by us in competition with Europe, and there is no reason why we could not have the same success in producing a full line of colors with the proper support on the part of the American consumers and the United States Government, as already mentioned.

In conclusion, we wish to ask the indulgence of our friends and customers for our failure to supply them with a sufficient supply of colors to meet their needs, and attend to their correspondence and laboratory work as promptly as usual, the delay being caused by the overwhelming demand upon us for colors, due to the fact that customers who had not been buying from us turned to us at once when they could not get colors from their regular source of supply, and it was therefore impossible for us to attend to this largely increased demand with our present equipment. We are, however, doing our very best to supply the American consumers at reasonable prices based on the increased cost of raw materials, and, as we have already said, will continue to produce colors irrespective of European conditions, to the extent of our capacity.

Yours very respectfully,
NATIONAL ANILINE & CHEMICAL CO.,
I. F. STONE, *President.*

The Dyestuff and Chemical Situation

Extracts from
Address before The National Printing Ink Manufacturers' Credit Association
September 25th, 1914

I. F. Stone

There is no insuperable reason why my company or any other properly equipped chemical manufacturing company in the United States cannot supply the same quality and amount of colors as we are getting from Germany. We have every raw material necessary, and we have the ability and skilled labor. It is not a question of materials—or experience—or capital—we have made all these colors and can do it again. We have an investment of about one and one-half million dollars and stand ready to invest as much more if the proper conditions of trade can be assured. Every time an American manufacturer puts out a color that in any wise competes with the German product, the price of the German article is at once cut to a figure that, with our high-priced labor and higher overhead expense, is impossible to meet. What is needed is a considerable higher tariff on imported colors, and also a patriotic willingness on the part of American buyers for a time—perhaps for a long time—to pay a higher price for goods than they have been accustomed to doing, to make some personal sacrifices in order to secure a permanent base of supplies in this country. Capital certainly will hesitate or refuse to make the necessary investment simply to bridge over the time until German competitors are again ready with their price-cutting and unfair competition.

German chemists probably have one hundred million dollars invested in the industry. American trade uses but a small part of their output, and if there are losses because of lower prices to us they can easily absorb them in the better prices charged on the bulk of their product going to other countries. They do not intend, if they can prevent it, for the color industry to get a footing in the United States. I believe they will resort to the extreme of price-cutting and unfair methods to kill off any attempt to make colors here, because what they fear, and intend to prevent, is competition in their own export trade. It will, as I have said, require much patriotism and loyalty—and no little sacrifice on the part of everyone to bring about a complete establishment of the industry in America.

Coal Tar Colors of America

Address Before the American Chemical Society,

New York Section, October 9, 1914

I. F. STONE

MR. CHAIRMAN AND GENTLEMEN:

It gives me great pleasure to be able to appear before you this evening, to clear up, if I can, the general skepticism which seems to exist in connection with the manufacture of coal tar dyes in the United States.

Aniline Dyes are Made in the United States

Prejudice Against American Dyes.

That there is such an industry in the United States is a fact and has been for over thirty years. That we cannot compare with Germany in magnitude is of course true, and that we will be able to increase our production in the near future to take over all of the colors now supplied by Germany is also manifestly impossible, but that it is possible to increase the American production very materially is a fact, depending on certain conditions of which I will speak later in my remarks. That there has been more or less prejudice against dyes made in America is also true, in spite of the fact that these dyes are fully as good as any made in Europe, and it has been a struggle to prove that the latter statement is absolutely true. Even at this late day there are people who would always give the preference to European dyes at the same price and quality, if they had an opportunity to do so, and are abetted in their belief very naturally by the European representatives. Only a few days ago among other letters we have received asking about the manufacture of dyes in this country, was one from a very substantial trade journal which circulates largely among the textile mills. Among other things it says:

"No one believes that the American dyestuff manufacturer can compete with the German. The Germans are counted wizards in dyestuff chemistry and I doubt if you could interest a great number of manufacturers in a domestic product at the same price as quoted on exactly the same thing from Germany."

Prejudice Disappears.

After a couple of pages of such argument it finally suggests that we take up the matter of advertising with them to change the sentiment of the buyers, which is very naïve to say the least. But the point is, if a journal with the influence of this one should express such sentiments among its subscribers, how unfair it would be to the American manufacturers of dyes, and it is simply an instance of one of the small things against which they are struggling. On the other hand, in the past few weeks we are encouraged by numerous letters from actual consumers of dyes, among them some of the largest textile mills in the country, thanking us for the way we have been furnishing them our products during the present abnormal conditions, and advising us that they would in the future give their preference to American colors whenever we are able to offer them in competition with foreign colors; in other words, able to supply them with the quantity of colors consumed, which hitherto we have not been able to do by reason of not having a production sufficiently large to take care of all the trade; so life does have its compensations and the American dyestuff industry from now on in any event starts out on an equal footing with the German industry, as far as the good-will of the consumers is concerned, and it is therefore only a question of being able to produce a large enough quantity at competitive prices to insure a large proportion of the business of the United States for the American manufacturer.

Barely two months ago a comparatively small percentage of the population of the United States knew anything about aniline dyes or dyestuffs, those who did know something being mainly connected with industries which used these products in their line of business. Even those who did use them had only a vague idea as a rule what they were and their source, except in a general way that they were made from coal tar and that Europe was the principal source of supply. They were even regarded by a large percentage of the consumers as a mere detail of their business, and were put in among the sundries with such items as oil, soap, and I might almost say paper, string, and such miscellaneous supplies, notwithstanding that it requires the highest order of scientific training to produce these colors and a long experience and knowledge of them in order to sell them successfully. The average dyestuff salesman was received only with tolerance and usually referred to some minor employee of the owner for his interview. Suddenly something happened. A great war was declared, and the great source of supply was one of the principal nations involved. Some buyer, more intelligent than the ordinary one, discerned that the supply of dyestuffs would be more or less limited if not entirely cut off under these conditions, and immediately made attempts to secure a good supply for his future wants. The news soon spread among others until there was a general scramble for dyestuffs, and men who ordinarily gave the matter very little attention are now looking after it personally and interviewing and corresponding with the heads of such firms as they think can supply them with their wants. The newspapers took up the matter and published columns of more or less accurate information as to the situation. The general public was therefore given an idea of what was going on, and now know more of the source and supply of aniline products than they ever knew before.

Conditions Before the War.

Something Happens.

The unfortunate conditions now prevailing have at least been of some good in a small way in educating our people here to the fact that they should be as independent as possible of other nations in connection with their supply of such products as are needed in this country, and there

Present Conditions.

is now a general demand that the production of aniline dyes as one item should immediately be developed to such an extent that we would be independent of all other nations.

Can the U. S. Aniline Industry be Developed.

The serious question now therefore is whether or not such industry can be developed to such an extent, and this question can only be answered by some extended and more or less superficial explanation of conditions. It is not my intention to put before you a scientific or technical paper on the subject, as most of you are more or less familiar with the general conditions surrounding the manufacture of these products, or at least can easily read up in detail in any of the standard publications on the subject. I do wish to give you, however, a practical statement of the fact so that you will see why the industry has not developed in this country as it has in Europe, more particularly in Germany, as other nations are no further advanced than are the United States.

Aniline Described.

Aniline, as you know, is a product of coal tar, that is, coal tar is the primary raw material from which colors are produced, and it was obtained originally in the manufacture of coal gas, but of recent years a large and constantly increasing quantity has been obtained from the coke ovens used for making hard coke.

First Products of Aniline.

Benzole.

The first distillates are such products as benzole, toluole, xylole, phenol (carbolic acid), naphthaline, anthracene, etc., and these are produced largely in the United States as well as in Germany; benzole, for instance, which is probably the most important of the group, is not only used as a base for the manufacture of intermediate products for the manufacture of aniline dyes, but is also used largely as a solvent in place of benzine and gasolene, and, in fact, in Europe is used largely as a fuel for automobiles as a substitute for the same products. The prices at which it sells in this country are practically the same as in Europe, as are also, in fact, the prices of the other distillates first mentioned. Up to now, the supply has kept pace with the demand, and there is no over-production, but if the manufacture of dyes is to be considerably extended it will then be also necessary to extend the production of benzole, and this can be done in the course of time by getting the assistance of those coke ovens who do not at present recover their benzole, to put in appliances for doing so. Their interest in the matter, however, depending on their ability to make a profit on this recovery, there is therefore a chance that the price of benzole may increase to some extent for this reason.

Naphthaline.

Another of importance is naphthaline, which is made largely because there is a large demand for it, the consumption in the United States being upward of nine or ten million pounds, not alone for its use in the manufacture of dyes but more for its use as a moth preventive, it having a large sale for this purpose all over the land. Of the quantity consumed here about one-third is produced in the United States while the balance comes about equally from Germany and England.

United States Starts Out Even With Europe.

It is evident, therefore, that the United States starts out on an even basis with Europe as far as the supply of the first raw materials is concerned, and that the natural resources of this country are available for an increase in the products which are manufactured from this source. So, in the beginning, for raw material we are as well placed here as they are in Germany; in other words, this is not a hot-house industry as some people have claimed but is a part of the natural resources of the United States.

Intermediate Products.

From these distillates are manufactured what we call intermediate products such as nitro-benzole, aniline oil, aniline salts, toluidine, xylidine, cumidine, benzidine, binitro-benzole, nitro-benzole, sulfo-acids, and a host of other products, a list of which can be had from any good text-book on chemistry if you are interested in looking them up further.

First Check in Economical Manufacture in United States.

It is here that the first check in the economical manufacture of aniline dyes is encountered, for the reason that with one or two exceptions, which I will mention later, none of these intermediate products are manufactured in the United States because up to now there has not been a large enough demand for them to make their manufacture economically possible, while on the other hand Europe —Germany particularly—has so developed the demand for these intermediate products that many plants have been established for their manufacture, most of them specializing on certain products, while some specialize on others, so that in the aggregate they are all produced on the most economical basis. Up to within recent years few of the aniline dye manufacturers manufactured these products themselves but depended largely on the aforementioned so-called specializing factories for their supplies, but this is now changing and some of the large color manufacturers are now making the principal intermediate products themselves, although none of them make everything which they use. It is, then very necessary, if the United States is to be independent of Germany, that these intermediate products be manufactured on a large scale in this country, and it is here that we ask the Government to start in with a sufficient protective duty to allow the business to be developed, the present duty of 10 per cent, which was only put on in the last tariff bill, not being really sufficient for the purpose, and before that time, the group being free of duty, there was no incentive to begin their manufacture here.

It is Necessary for United States to be Independent of Europe.

One exception which was manufactured here is aniline oil. the manufacture of which was commenced about three years ago, and the quantity now produced is about one-quarter and perhaps more of the total consumption of the United States, taking oil and salts as one product. The quality is very satisfactory as compared with the German and English products, and has been used by our own factory in the manufacture of aniline dyes since the beginning; in fact, if it were not being produced in this country at the present time the American dye manufacturers would not be able to continue to run, as they would be unable to obtain supplies from Europe, and consequently, as a result of this, manufacturers here are able to relieve the scarcity of aniline dyes, and have been of great benefit to American consumers by so doing, and will be a great factor in this relief as long as these unfortunate war conditions continue, so illustrating the great benefit to the people at large in

Aniline Oil.

Advantage of Manufacture United States.

having this class of products manufactured here, and so be entirely independent of Europe under any conditions. Unfortunately, however, the commercial side of the manufacture of aniline oil has not been so satisfactory for the reason that in the beginning they had no protection in the way of duty and were compelled to compete on an even basis with Europe, which could not be done successfully. They did, however, succeed in securing a duty of 10 per cent under the present tariff, which went into effect in October, 1913, just a year ago, but unfortunately this did not avail them anything in the beginning for the reason that the convention which controls the production of aniline oil in Europe immediately reduced their prices 10 per cent to offset this duty, so that we were no better off here than before, this being a sample of what is called unfair competition on the part of European firms in their attempt to prevent the increase of the aniline industry in this country, but could be readily checked if our Government would incorporate in their tariff what is known as the "dumping" clause, which is a clause forbidding the importation into and the selling in the United States of any products at a less price than they are sold in the country where they are produced. In spite of this check, however, the American manufacturers will continue the manufacture of oil, hoping that conditions will change in the near future so that they may be able to do so at a profit, and when this object is attained their plans are then to take up the manufacture of other intermediate products, until everything necessary is finally manufactured here. As a matter of further interest, I might say that our own factory in Buffalo made aniline oil thirty years ago, but were obliged to give up its manufacture at that time owing to their inability to secure benzole, which situation is, however, now changed, as sufficient benzole could be obtained to continue the manufacture under advantageous conditions.

Unfair Competition.

The other exception to my statement that these intermediate products are not manufactured here is nitro-benzole, known also as crude oil myrbane, which is in some demand from outside industries as well as the aniline industry, but not to so large an extent as aniline oil, and

Nitro Benzole.

which is made here from time to time as conditions warrant; in other words, when it can be made at a profit in competition with Europe.

Explosive Products.

There is another demand springing up for these intermediate products which may increase their consumption to such an extent that there will be a large demand entirely outside of the aniline industry, for instance in the manufacture of smokeless powder and other explosives, the manufacturers of which are now using such products as diphenylamine, tri-nitro-toluole, nitro-benzole, pyridine, nitro-naphthaline, etc., and will finally create a demand which will necessitate their manufacture in this country as a matter of safety, as if the Government depended on explosives made from these materials, it will in self-defence have to create some sort of subsidy or tariff protection, making it possible for their manufacture irresponsible of European competition.

Carbolic Acid.

This is also true, by the way, of carbolic acid, which is a primary coal tar product, and which is used in the manufacture of picric acid, an explosive product used by the Government; carbolic acid not being manufactured here at present to any extent and now being practically unobtainable from Germany or England by reason of these countries having placed an embargo on this product.

Aniline Dyes.

900 Different Kinds.

100 Made in United States.

From these so-called intermediate products we then come to the manufacture of the actual aniline dyes as sold in commerce, and their number is voluminous and complex. My good friend, Dr. B. C. Hesse, an acknowledged authority, for instance, recently stated in a published letter that there were some nine hundred different manufactured products, most of them as different each from the other as a pair of shoes is from a pair of socks. Of these nine hundred he observed that some seventy-six are now made in this country, but that this number is apparently not sufficient to meet the users' demand, in which statement I am quite ready to agree with him, except that we now make nearly one hundred types, which is more than he gives us credit for making. I will say, however, that of these nine hundred original types a great many are obsolete and probably we could get along quite well with a much less number, but as the one hundred made in America are all live types, and those which can be manufactured regularly, you will see we are making really a much larger percentage of the total than is apparent at first glance. In fact, I might almost venture the statement that with the hundred or so types already manufactured here, together with perhaps a few more which we would be prepared to take up on short notice, we would be able to furnish the American consumers perhaps 90 per cent of their color demands, speaking now of types or shades and not of quantity; the other 10 per cent which we could not furnish being such products as alizarines, indigo and patented specialties which would require large installations which would take a long time to complete.

Discovery of Aniline Dyes.

It would perhaps be interesting in connection with these colors to give a hasty sketch of their beginning and development until the present time, when they have resulted in the great chemical industry of Germany, the investment of millions of dollars and the employment of thousands of people.

The first color discovered was mauve, which is a sort of violet, by Perkin in 1856; then followed magenta and fuchsine in the same year, and a small establishment for the manufacture of same in England, which was not, however, very successful. Then came in 1862 the discovery of soluble or water blues, then the discovery of Hoffman's violet about 1863, Bismark brown in 1863, then naphthol or martius yellow in 1864, nigrosines in 1867.

Germany Becomes Interested.

It was about this period that the Germans became actively interested in these products and commenced their patient, intelligent and careful researches into the subject, which later resulted in the most wonderful discoveries and the development of this industry in their country.

Then followed the discovery of orange, fast red, chrysoidine, malachite green, ponceau (scarlet), methylene blue, eosines and metanil yellow about the years 1875, 1876, 1877 and 1878, and the manufacture then became one of recognized merit and importance.

After 1880 followed in rapid succession the discoveries of auramine in 1883, tartrazine in 1884, benzo purpurine in 1884, Congo red in 1885, benzo azurine in 1885, naphthol black in 1885, diamine red in 1886, rhodamine in 1887, to mention only a few of the best known and most successful colors.

The Golden Period.

From 1880 to 1890 might be called the golden period of the business. Just prior to that time alizarine had been discovered, red in 1871, blue in 1877, patented, and successfully produced and sold at high prices with correspondingly large profits, and it was about that time that our German friends discovered the advantage of securing an exclusive market in the United States through their patents which enabled them to sell at high prices here, although continuing the manufacture in Germany, as the profits from such patented products as alizarine, benzo purpurine, diamine red and other direct dyeing cotton colors; auramine, rhodamine, tartrazine, and other such colors which were discovered and put on the market in that period, were enormous and put the German industry immediately on such a high pinnacle of success that it has continued until the present time.

In the nineties came the discovery of such important products as direct blacks for cotton, and acid and chrome blacks for wool, the total consumption of these blacks being much larger than all the other colors combined.

It was also at this same period that began the first of the patents on synthetic indigo, of which there are many, and which was finally put on the market at such a tremendous expenditure, and has only been a commercial success in the past few years, finally being such a success that it has replaced the natural indigo practically altogether.

Pharmaceutical Products.

I might say in connection with the development of colors, that in the nineties came also the development of such pharmaceutical products as phenacetine, antipyrin, etc., which paid enormous profits to the manufacturers and which were also controlled by patents.

Such, then, is the wonderful development of the coal tar industry, there being invested at this time in Germany something like four hundred millions of dollars, probably more, and the employment of some fifty thousand people; factories paying dividends to their stockholders, some of them, 25 to 30 per cent, and that after charging off a third of their profits to sinking funds for the erection of new plants and for other such purposes, in fact, this has been done for so long a period that most of the present property and plants do not appear on their books at all as an asset, but have been built out of the surplus profits. This statement is made on the basis of a balance sheet for 1913 issued by one of the great factories, this factory having a capital of 55 million marks but whose stock is selling for over six times par value, showing that the actual capital in the business was at least four times the shares issued, or some 200 million marks. On a capitalization of 55 million marks they showed a profit of 25 million, or nearly 50 per cent, one-third of which was written off for their real estate and plant account, leaving about 16 million marks, from which they paid a dividend of 28 per cent. Assuming that I am correct in my estimate of some four hundred million dollars being invested in the industry in Germany, and assuming that a fair proportion of their production is shipped to the United States, it would mean that if the United States were to develop this industry to take care of all their consumption here they would need millions of dollars and would need to employ thousands of people, so this will give you an idea of the magnitude of the business that it is now proposed that we establish here to its full extent.

Wonderful Development of Coal Tar Industry.

Profits of a German Factory.

Imports Into United States.

It might be interesting at this point to give you the amount of aniline products imported into the United States from these European factories, the figures being for 1913:

Aniline dyes, about	7	million	dollars
Indigo, "	1	"	"
Alizarines, "	1½	"	"

a total of about 9½ million dollars, these figures being, however, cost prices, and when the American duty of 30 per cent is added on aniline dyes, and further amounts

Amount of Sales in United States.

added for expenses and profits on their sale here, it means that the American consumers are really paying something like twelve million dollars for their supplies, not counting the colors produced in America, which may perhaps reach about two million dollars more, the production in America, by the way, being some 15 to 20 per cent of the total consumption. These figures do not include the importation of pharmaceutical products which are made from coal tar and which is in itself a large business.

Germans Entitled to Benefits of Their Discoveries.

Our German friends are entitled to all the benefits which have accrued to them by reason of their shrewd, intelligent and careful attention to this industry, but with such a statement as the above, does it not seem as if they had had enough and it is now time for the United States to participate in this great industry, when they are so well prepared to do so by having as good, if not better, natural resources than has Germany, and being consumers of so large a proportion of the German products. We must admit at once, however, that the United States cannot compete with the German manufacturers under normal conditions; first, because they have a great advantage in capital, experience, and the general advantages of everything that goes with a successful and enormous business; and second, because the actual expenses of producing in Germany, through labor conditions and so forth, are much less than in this country; so that some way must be devised that the United States can be put on a competing basis. This can only be done in two ways:

United States Cannot Compete with Germany.

Tariff Protection First Way to Compete.

First, by a sufficient protective tariff, which does not necessarily mean, by the-way, that this will increase prices to the consumer, although many people seem to be of this opinion. For instance, in an article in the *Scientific American* of September 26th they fall into this common error in stating that with an average importation of about six million dollars' worth of coal tar dyes in the last thirty years we have a total importation of 180 million dollars during that period, and assuming that duties had been 10 per cent higher than was actually the case, this means that a total of eighteen million dollars would have been paid as an insurance premium against the possible event of the war such as that which is now disturbing commerce; in other words, they mean that the American consumers would have had to pay this large amount of money more if there had been a 10 per cent higher tariff than they had been paying under the various tariffs which had been in effect during that time. Even if the *Scientific American* were correct in their statement that eighteen million dollars would have been paid as an insurance premium in thirty years, this would really be cheap insurance compared to the enormous value of the goods manufactured in which the colors were used, assuming the colors with which to manufacture these goods could not be obtained and the goods therefore could not be manufactured, which is almost the situation as it stands today if colors are not soon obtained in the necessary quantities either from Europe or by an increase in the American manufacture. When I speak of goods in which aniline dyes are used I mean a whole range, such as textiles, leather, paper, silk, paints, and the hundred and one other manufactured products in which the use of aniline is necessary.

Higher Tariff Does Not Mean Higher Prices.

In my opinion, however, based on experience, just the contrary to the *Scientific American* opinion is true, for the reason that a higher tariff would have stimulated production and competition, and competition always controls the price, and this is shown clearly by actual facts, for instance on indigo and alizarine colors there is no duty, and as a consequence they are not made here. Theoretically, therefore, they should be sold very cheap, but as a matter of fact, by reason of no competition here, they are controlled by conventions in Europe which make a uniform price and consumers are therefore unquestionably paying more than they would have to pay if such products were made here in competition. On the other hand, take for instance direct cotton black, which is an aniline dye which has a protective duty of 30 per cent and which is made in this country in large quantities, and on which the Europeans have been obliged to reduce their selling prices in this country to less than they sell for in Europe, so that

American consumers are enjoying prices as low as 17 to 18 cents for a color which sells at from 22 cents and upwards in Europe under normal conditions.

Benefits of Competition.

Does any one believe that the low prices would have been made in this country were it not for the competition here, and does it not therefore prove that competition here regulates the price and it is not so much a question of duty? What the American manufacturers want is not so much a high duty as it is that they want enough to equalize the difference in manufacturing conditions between this country and Europe, and protection against the so-called unfair competition referred to in my remarks in connection with aniline oil; in other words, the inclusion of the so-called "dumping" clause; and with a proper tariff on these lines the business could be successfully developed. I might say further that if we could get our intermediate materials at the same prices which are paid by the Germans, and then secure for our colors the same prices obtained by the Germans for finished colors in other countries, plus the actual American duty, the problem would be solved, as this actual American duty if sufficient would then cover our extra cost of manufacturing, and put us in the exact position as are the Germans as far as our selling prices are concerned.

Second Way to Compete Patent Laws.

And second by the modification of our patent laws, so that they would require the manufacture in the United States of all such articles for which they issue patents. England has within the last few years made such changes in her patent laws, and as for Germany, she has always required the manufacture of patented products in her own country. Her present law reads in general, that the owner of a patent must work the invention to an adequate extent in this country (Germany), or at all events do all that is necessary to secure such working, and if not, then if the public interest is such that the granting of permission to others to use the invention appears needful, it is granted by making some arrangement with the owner of the patent so that he receives adequate compensation, but the manufacture of the product itself is insured for Germany. About 1909 a similar clause was threatened in the patent laws of this country, and to head off such action Germany negotiated a treaty with the United States by which the German working clause was made inoperative on American inventions; in other words, in return for the United States allowing Germany to continue to manufacture her products in Germany and export them to the United States, the United States was allowed a similar latitude in exporting her patented products into Germany, but whether or not the financial results of this treaty were beneficial to the United States is a question, but it certainly did not work out to the benefit of the United States as far as coal tar products are concerned.

Favorable Conditions in United States in 1880.

In what I have always termed the golden period of the industry, viz., from 1880 onward, there was from 1880 to 1883 a duty of 35 per cent ad valorem and 50 cents per pound specific, which gave ample protection to the industry, and as a consequence there were nine or ten factories in the United States, and the prospect of becoming independent of other nations for our supply of these aniline products was bright indeed, but the passage of the tariff act of July 1, 1883, which abolished the specific duty of 50 cents per pound, leaving only the ad valorem duty of 35 per cent and fixing a 20 per cent duty on the intermediate products, which left only a net protection of 15 per cent, immediately checked the industry here. No new factories were started, and within one year after the new tariff took effect five of those already established were forced to succumb and go out of business, leaving only four to continue the work, and those four would have gladly followed their example, but had invested large sums of money in plants which would be an entire loss if abandoned, so they decided to continue to operate their factories, hoping for more favorable legislation in the near future, but thus far they have always been bitterly disappointed, and no tariff since that time has given them sufficient protection to develop the business to any large extent. Of course a specific duty of 50 cents in those days was not abnormal, as the selling prices of the colors were so much higher than at present, and if a proper duty had been continued it would have had

Favorable Conditions Disappear 1883.

the same beneficial effect, but the abandonment of a sufficient duty has left open the admission of colors on a basis which really gives no protection at all.

Benefits of Favorable Laws.

In addition to the first or protective question as a stimulant to the creation of this industry in America, and coming to the second reason, or patent situation, if the Government had in the same golden period, viz., the eighties, required the manufacture in this country of all products for which they issued patents, then it would have at once created a large industry here, as the European patentees would have been forced to build factories here to make these products, which means it would have resulted in branches of the European factories in this country, which would undoubtedly have developed into other products even though they may have originally only been erected for the manufacture of patented articles, and while this would not have helped the then American factories it would at the same time have inevitably created a large industry here with beneficent results to the country at large.

Four Factories in United States.

What They Are Making.

As I have stated, there are now four factories in the United States manufacturing aniline dyes, our own factory having been established in 1879, and while of slow development, at the same time has been successful to the extent that it has kept in business and now manufactures practically all of the seventy-six different colors mentioned by Dr. Hesse, or, to be correct, the one hundred, and to which I referred in the beginning of my remarks, these colors being all of the original colors such as Bismark brown, magenta, chrysoidine, fast red, water or soluble blues, eosines, nigrosines, a comprehensive line of direct dyeing cotton colors, and a comprehensive line of acid and chrome colors for wool and silk, and could easily be extended to the manufacture of practically all of the necessary colors now demanded, and which are not covered by patents, so giving the consumer a large variety to choose from, and insuring practical independence of Europe under any conditions, and would be a large business in itself, except by comparison with the great German factories, which stand alone in their magnitude.

What They Will Continue to Do.

All of the American factories will continue to manufacture colors to the best of their ability, but they cannot promise any extensive increase in their production without the support of the Government in the line of tariff protection, and, incidentally, the change in the patent laws, which, however, are not now quite so important as to colors for the reason that many of the original patents have expired and we are free to manufacture a large line of colors provided it is made commercially possible for us to do so, we having already demonstrated our ability to do so as far as experience and willingness are concerned. I might mention, as far as our own factory in Buffalo is concerned, which, by the way, is widely known as the "Schoellkopf Aniline Works," were the pioneers in the manufacture of such products as nitro-benzole, nitro-toluole, binitro-toluole, binitro-benzole, aniline oil, aniline salts, dimethyl-aniline, and quite a range of sulfoacids, some of them of our own invention, which are necessary for the manufacture of both acid and direct colors. We have also made such products as pure carbolic acid and pure naphthaline, but were obliged to give them up as well as the others because we could not compete with the European manufacturers, but we are now hoping that they can again be taken up, either by us or by possible manufacturers of intermediate products, and the manufacture continued successfully in this country. Under the present abnormal conditions our factory is again making some of these products in order to keep in operation, as just at present it is not a question of price but of ability to manufacture aniline dyes, almost no matter at what cost, such is the demand, but whenever conditions become more normal again then we will necessarily have to give up the manufacture of these intermediate products for the same reasons that we have had to give them up before, viz., that we can purchase them in Europe at lower prices than they can be manufactured here.

Schoellkopf Aniline Works Pioneers.

What We Are Now Doing.

35 Years' Continuous Experience.

I might mention further that our factories in Buffalo are still controlled and directed by Mr. J. F. Schoellkopf, who originally established them, being assisted a little later by his brother, Mr. C. P. Hugo Schoellkopf, so that they have had nearly thirty-five years of continuous experience in the manufacture of aniline products, and are fully competent to continue the manufacture in a large way should conditions develop so they can be increased.

Not an Appeal for Sympathy.

This paper is not intended to appeal for sympathy or help from the Government or from American consumers, because we happen to be so placed for the past few years that we could not develop our business as it might have been developed under different conditions, as the American factories, even as they are, are prosperous and quite able to take care of themselves up to a certain point, but it is intended to show that the business cannot be extended to large proportions for the protection of American consumers unless with Government help as to tariff and patent laws, as well as the assistance of the consumers themselves, which means giving the American manufacturers the preference wherever they can do so and assisting them to secure the necessary help from the Government.

The Present and Future.

Here, then, is the superficial history of the progress of the aniline industry from its inception to the present time, not only in this country but in Europe, and the situation as related to the present and future manufacture of these products in the United States fully explained. Will the United States Government continue its indifferent policy of practically allowing this important industry to drift along as heretofore, or will it now wake up and seize the opportunity to make itself independent of all other nations in its supply of coal tar products, not only for aniline dyes for commercial purposes, but pharmaceutical products which relieve illness and pertain to the health of its inhabitants, and products for the manufacture of explosives which would be absolutely vital in case of war? The future alone can answer these questions.

ADDENDUM

After reading this paper, in reply to a question as to whether or not any original work had been done by the American dye manufacturers, that is, had they discovered any new products, Mr. Stone stated that sixteen patents had been taken out by the Schoellkopf Works between 1884 and 1903, comprising colors and intermediate products. One of these products known as Schoellkopf acid had been taken up by one of the largest German manufacturers and used extensively by them; another product, direct black, had been taken up by another large German factory and also made extensively by them. Both products were used, of course, through arrangements with the Schoellkopf Works. So the question could be answered in the affirmative.

Discoveries and Patents.

Report of the Chemical and Dyestuffs Committee of the American Chemical Society

New York Section

November 6, 1914

To the New York Section, American Chemical Society:

1. At the meeting on October 9, 1914, the chairman of this Section was authorized to appoint a committee to investigate into the feasibility of expanding the chemical and dyestuff industry in the United States and to report to this Section on November 6, 1914.

2. The undersigned committee was appointed October 15 and at once proceeded. It addressed letters of invitation to co-operate to those who have been most active in the public prints in urging expanding of the chemical, and particularly the dyestuff, industry in the United States; further, an invitation was extended to the maker of the motion, which resulted in the appointment of this committee. The assistance from these is nil.

3. A request was addressed to trade publications in the city of New York and to some of the metropolitan dailies; in all nine such publications were requested to publish a suggested notice for the purpose of inviting co-operation; the object of this committee was set forth and request was made that suggestions be mailed to the chairman of this committee. All but one of these publications have complied with that request. No help has been obtained by

this committee from any suggestions mailed to it as a result of this publicity.

4. Your committee has carefully considered all the public suggestions as to methods of improvement and has searched through the governmental regulations of the belligerent nations as to embargo and as to contraband of war, in order to construct therefrom a list of chemicals, inclusive of dyestuffs, which have thereby been shut off from the United States, in the hope of thus being placed in a position to make specific recommendations of value.

5. It can be fairly stated that, in general, the chemical industry of this country is efficiently exploited and is making full use of all the opportunities presented to it under the normal conditions existing prior to the state of hostilities. Some of the chemicals which are imported from abroad are made in considerable amounts in this country as well, and the amount imported under normal conditions depends upon the ordinary normal fluctuations of business conditions both here and abroad. With the stoppage of this foreign supply the domestic production was not at once capable of making up the deficiency, but in a number of instances the American manufacturers have taken steps to increase their capacity, and the strain in the market of those particular things will exist no longer than it will require to extend the manufacturing facilities to the proper extent.

Among these are ammonia salts, barium chloride, barium nitrate, bleaching powder, sodium cyanide, yellow prussiate, sodium nitrite, sodium hydrosulfite, zinc dust.

6. If, however, it be desired and if public necessity requires the introduction of the manufacture of explosives and further chemicals and dyestuffs into our home industry, such as coal tar product explosives, pharmaceuticals, medicinals and other intermediates and finished coal tar dyes, then alterations of our tariff law are inevitable, and the consumers in the first place and the public in general must share in the burden thus imposed. If conditions of national defense in case of attack by a foreign power require us to manufacture our own explosives, and to be

in that regard independent of all foreign nations at all times, or if our textile industries or any other of our industries requiring coal tar chemicals, such as dyestuffs, shall forever be protected and made independent of foreign nations for the supply of those materials, then the nation as a whole must bear the burden incident to such expansion. Under existing circumstances private enterprise and private capital have gone their limit. They have reached the limit for two reasons:

I. The explosive, dye and similar industries abroad, just referred to, are in a state of high development and of refined organization, and are financially the best suited to carry on an offensive campaign against any nation attempting to take business away from them.

II. Domestic manufacturers are prohibited by law from making use of co-operative commercial devices, such as pools, trusts, manufacturing and selling agreements, and the like, whereas such devices are wholly lawful abroad and are encouraged by the respective governments. In other words, the American chemical industry is expected to cope with the foreign industry while both its own arms are tied behind its back and its opponents have full and free use of their arms.

ANTI-DUMPING CLAUSE

7. The remedies required would be an effective anti-dumping clause that would certainly prevent underselling of domestic manufacturers in the United States by unfair methods. What the form of such clause shall be is a problem with which your committee is unable to cope; it is strictly a law-making and law-enforcing problem, and is allied to the usual problem of determining undervaluation as heretofore carried on by our Treasury Department; it, however, is a much more refined problem than the older problem of proving undervaluation. Nevertheless, your committee believes that with such a mechanism in our law that much would be done toward encouraging our chemical industries.

TO CREATE COAL TAR CHEMICAL INDUSTRY

8. According to the best information that your committee can gather, such an anti-dumping clause alone would not be sufficient, however, to create complete and independent domestic coal tar explosives, dyestuffs and medicinals industries. It has been conclusively demonstrated during the past thirty years that the present tariff rate of 30 per cent on dyestuffs is not sufficient to induce the domestic dyestuff industry to expand at a rate comparable with the consumption of dyestuffs in this country, and that therefore all dyestuffs made from coal tar, whether they be aniline dyes or alizarin, or alizarin dyes, or anthracene dyes or indigo, so long as they are made in whole or in part from products of or obtainable from coal tar, should all be assessed alike, namely, 30 per cent ad valorem plus 7½ cents per pound specific, and that all manufactured products of or obtainable from coal tar, themselves not dyes or colors and not medicinal, shall be taxed 15 per cent ad valorem and 3¾ cents per pound specific.

TARIFF TO AID DYE INDUSTRY

9. The best information and judgment your committee can obtain is that the above mentioned products of coal tar, not dyes and not colors and not medicinal, should carry one-half the duty of the finished coal tar dye and that the above rate of 30 per cent ad valorem and 7½ cents specific would probably be sufficient to encourage and enable domestic manufacturers to expand their operations to such an extent as to supply a very material increase in, if not the whole, of these commodities consumed in this country. The reason for a specific duty is to protect the domestic manufacturer in the manufacture of the relatively cheap dyes, such as the cheap scarlets, the cheap yellows and the like, whose prices abroad are in the neighborhood of from 12 cents to 20 cents per pound. With dyes of that type 30 per cent ad valorem would not offer so serious an obstacle to importation and underselling thereof as does

the 7½ cents per pound specific; on the other hand, on dyes whose prices are $1 and upward per pound the function of the 7½ cents specific more nearly approaches zero. That is, with the cheap dyes the chief function lies in the specific portion of the duty, and with the expensive dyes the chief function lies with the ad valorem portion of the duty.

This is said to be the price the nation will have to pay to have a complete self-contained and independent coal tar chemical industry. However, it must be remembered that if such an industry be created and importation of coal tar products, inclusive of intermediates and dyes, is restricted, its ultimate effect upon the Federal revenues will have to be considered. It will, therefore, be necessary to determine carefully if the advantages to be gained are equal to the price to be paid.

PATENT LAWS

10. This committee is a unit in the belief that an alteration of our patent laws aiming at compulsory working or compulsory licensing would not be any substantial benefit to this industry or to the country as a whole. Twenty-nine countries have attempted compulsory licensing clauses and fifty-six countries have attempted compulsory working clauses, and the best information your committee can obtain is that in none of these attempts has there been any appreciable measure of success. While it may be true that under extraordinary conditions, such as now exist, compulsory licensing might have some advantage, yet it is equally true that in normal times the disadvantage due to compulsory licensing or compulsory working would more than overbalance any advantage at all likely to be obtained under stress of unusual conditions.

11. In none of the countries where there have been working or licensing clauses, or both, co-extensive with the existence of the coal tar chemical industry has there been established any real coal tar chemical industry, and your

committee does not feel that an alteration in our present patent laws could be made which would be effective against foreigners and at the same time not be onerous and a hardship to domestic inventors. Your committee believes that in the long run and, in the final outcome, our present system with regard to working and licensing is as efficient as that of any other country. In the dyestuff industry in particular there are so many non-patented commercial products and so many commercial products once patented now free from patent restraint that their production alone would form a basis for a very considerable industry, and your committee feels that the way to encourage that industry, if the establishment of that industry in this country be a national necessity, is through a change in the tariff and the additional anti-dumping feature in the administration of the tariff and not through any change in the patent laws. Once established, such an industry could develop and ultimately cope with any foreign combination upon fair and equal terms. Over 90 per cent of the tonnage and of the individual dyes used in the United States will be free from any patent restraint within the next four years; over 75 per cent of the dyes are now in that condition.

AVAILABILITY OF RAW MATERIALS

12. The best information your committee has so far been able to gather is that this country can produce so-called coal tar raw material in amounts sufficient for the needs of a complete domestic coal tar chemical industry, inclusive of explosives and dyes, provided there is a certainty of outlet as to volume and continuity. Those engaged in manufacture here do not want to expand unless the dye-users are willing to make corresponding contracts. In other words, it is a closed circle. If the dye-users will contract sufficiently with the dye-makers, the dye-makers will contract with the coal tar distillers and the industry will take a start. The initiative rests wholly with the users; if they cannot afford to contract the dye-maker and the distillers cannot afford to make their contracts and additional investments.

13. Benzol, toluol and the like are produced in sufficient amount in present installations of by-product coke ovens to provide all of these things that would be needed for a coal tar chemical industry of a magnitude sufficient to supply the United States market; the separation of these materials from the gas that carries them is dependent upon the market and the demand therefor. There is no inherent defect in our coke industry with regard to the actual making of these things; the only question involved is whether it be more profitable to burn the benzol, toluol and the like contained in the gas as a fuel than to separate them and from each other for purposes of sale. Ample supply can be provided before any plant that could use benzol and the like for dyestuff making could be erected in the United States and thereafter the supply of these materials can readily be kept up to any requirements.

14. The materials of the preceding paragraph are the ones used in the coal tar explosives industry, as well as in the coal tar medicinals and dyestuffs industries. Each of these three industries co-operates with the others to make full use of those materials, alone none can fully make use thereof nor succeed; the correct and proper utilization of these materials requires successful co-existence of all three industries in one and the same country.

15. Naphthalene and anthracene are contained in the tars produced in the United States in an amount sufficient for the needs of a domestic dyestuff industry, and it is merely a question whether it is more profitable to leave them in the creosote oil, where they now occur, or to separate them out of such oil and refine them for purposes of dye manufacture. Ample supply of either of them could be produced and provided at the same time or shortly after any plant could be erected in the United States for the use of these things in the production of dyes.

16. What has been said with regard to the supplies of naphthalene is also true of the supplies of creosote.

17. All the creosote oil contained in the total amount of

coke oven tar now made is separated from it and used. Increased production of creosote oil requires a greater production of tar, and a greater production of tar is dependent upon increased installation of recovery coke ovens.

18. Phenol or carbolic acid supply is primarily dependent upon our deliberately selected method of coal treatment; to change that treatment so as to get more phenol would entail abandonment of other advantages which would not be compensated for by the increased amount of phenol so produced. Under present circumstances freights and haulages play an important part. At isolated plants, separated by considerable distances from each other, small amounts of phenol are produced, and the separation of the phenol at such individual places would be economically unprofitable, and in order to concentrate this amount of phenol to or at a point where separation could be conducted profitably would entail freight haulages much in excess of the value of the phenol that would thus be transported.

19. The only source of phenol in sight is that produced synthetically from benzol by means of sulfonation and subsequent melting with caustic soda; this depends in turn upon our benzol supply, and would be profitable only so long as the United States market is not killed by the dumping of foreign phenol thereon, whether such phenol be synthetic or distilled.

20. Salicylic production depends upon availability of phenol, and the production of benzoic acid depends upon the availability of toluol, which has heretofore been discussed.

21. Phthalic acid made from naphthalene by means of bichromate cannot successfully compete with the mercury and sulfuric acid process, which is protected by patents having about three years more to run.

MISCELLANEOUS CHEMICALS AND RAW MATERIALS

22. Acetic anhydride can be made without trouble in this country, and will be made in this country so soon as the

domestic demand is large enough and steady enough to warrant the installation of a suitable plant.

23. Nitric acid.—All countries with the exception of possibly Norway and the countries importing from Norway are dependent upon Chile for raw material for making nitric acid. It will not be profitable to make nitric acid from air in the United States until the value of the electric horse-power reaches a level of $3 or $4 a year, as it is in Norway.

24. Ammonia and its salts all depend upon recovery coke ovens, and such recovery plants are increasing as fast as circumstances will permit.

25. Barium chloride and other compounds of barium may be made from domestic barytes. A number of attempts have hitherto been made, but with indifferent success. Factories established within the last year promise to be successful.

26. Magnesium chloride of a sufficient purity to be used in the production of flooring is almost generally made from magnesite found in Greece, which is the only deposit known having sufficiently high purity. There are reports of suitable deposits in California and in Lower California, and with the completion of the Panama Canal the question of freights, which seems hitherto to have stood in the way of developing these deposits, may be eliminated. Other sources, less remote from centers of consumption, and using other materials, e. g., brine waste, are about to be successfully operated.

27. Manganese in the form of pyrolusite is not known to occur in paying deposits in the United States; these are practically all in the Caucasus.

28. Potash.—In view of the great exertions that have been made for a number of years, both on the part of the Federal Government through a number of its departments and a great many different groups of capitalists, there is nothing to be said in this report that would be of any value with regard to increased production of potash either as fertilizer or as a chemical.

29. Yellow prussiate and sodium cyanide can be and have been made from domestic materials in such an amount as to provide practically the entire consumption or a great portion thereof in this country so long as there was a sufficient duty on them; the present duty is not enough to protect the American manufacturer, and those who were engaged therein have in large measure withdrawn from the business, but some are reported to be taking up manufacture cautiously and in limited amount.

30. Hydrosulfites in solution can be made from domestic materials without interference with any patent rights; the production of solid salts and derivatives are, however, still protected by patents that have a few years more to run.

31. Sodium nitrite is produced more cheaply as a by-product in Norway than it can be produced anywhere in the world; unless the price of the electric horse-power in this country sinks to a $3 or $4 level per year, as in Norway, this product cannot be manufactured in the United States.

32. Oxalic acid is and has been made to some extent in this country, and the information coming to your committee is that suitable efforts are being made to expand the capacity of existing plants.

33. Tartaric Acid and Citric Acid.—To make this country independent of others with respect to tartaric and citric acid would call for radical changes on the part of our grape growers and our lemon growers as to the policy of their business.

It is probably true that edible grapes do not produce argols (the crude material for tartaric acid) very largely, and that our domestic lemons do not produce as large yields of juice (the crude material for citric acid) nor as high an acidity as do the Italian lemons; therefore an independent supply of the raw materials produced in the United States for tartaric and citric acids is in the first instance an agricultural problem, and in the second instance a market problem.

GENERAL REMARKS

34. Finally, it should be pointed out that the United States is by no means the only country whose chemical and allied business has been strained or upset by the European War. Each and every other country has felt the strain. British committees have gone into this same subject of expanding British chemical industries, and not only that, but also into the question of making their very basic necessities, and the reports have so far been adverse to any immediate relief by domestic manufacture. The Boston Chamber of Commerce, through its committees, has arrived at the same conclusions for this country.

35. It is further clear that the stability of a complete domestic chemical industry, insofar as it depends upon foreign supplies, is bound up to a successful merchant marine and to an efficient foreign banking condition just as is all our foreign business.

FINDINGS

36. Your committee finds as follows, as to the facts:

I. Prior to the hostilities domestic chemical industry was utilizing and exploiting every reasonable opportunity to its full extent.

II. Since the outbreak of hostilities domestic industry has increased its output just as fast as physical means could be provided and physical obstacles overcome.

III. Since the outbreak of hostilities domestic plants that had theretofore been shut down or partly dismantled because of disastrous foreign competition are said to have resumed operation, with caution.

IV. That a 30 per cent duty on some coal tar dyes for over thirty years has not produced a real coal tar dye industry in this country.

CONCLUSIONS

37. Your committee submits its conclusions as follows:

A. To prevent the unfair underselling alleged to be practiced by foreigners in this country, the adoption of an effective anti-dumping clause.

B. The so-called coal tar "intermediates" which are the basis of the coal tar chemical industry, inclusive of explosives, medicinals and dyestuffs, should be assessed one-half of whatever the finished dyes are taxed for tariff purposes; all coal tar dyes without exception to be taxed alike, namely, 30 per cent ad valorem and 7½ cents per pound specific.

C. Changes in the patent laws such as by compulsory licensing or compulsory working clauses are wholly ineffective, do more harm than good and should not be attempted.

Your committee recommends that this report be submitted to the appropriate committees of Congress. Further, that this report be forwarded to interested organizations.

Respectfully submitted,

Bernhard C. Hesse, *Chairman.*
J. B. F. Herreshoff.
H. A. Metz.
I. F. Stone.
D. W. Jayne.
J. Merritt Matthews.
Allen Rogers.

[*Editorial from the Oil, Paint and Drug Reporter, November* 9, 1914]

THE DEVELOPMENT OF OUR CHEMICAL AND DYESTUFF INDUSTRIES

The exceptional opportunities for the development of the chemical and dyestuff industries in this country since the war forced the realization of the extent of our dependence upon foreign sources have been the occasion of widespread publicity, most of which has been of a superficial and chimerical character, and it was not until a meeting of the New York Section of the American Chemical Society on October 9 that the subject resolved itself into concrete and tangible form by a consideration by the best representative trade and expert interests of the questions involved in the attainment of the desired ends and the appointment of a committee to study the various conditions and to report the results at a meeting scheduled for last Friday night. The personnel of the committee bespeaks the most convincing and creditable accomplishment of its purpose, consisting of such well-known representatives as Bernard C. Hesse, chairman; J. B. F. Herreshoff, H. A. Metz, I. F. Stone, D. W. Jayne, J. Merritt Matthews and Allen Rogert, all native citizens of many years' active and intimate associations with both the commercial and technical phases of the chemical and dyestuff trades. Frequent meetings have been held and the research work so systematized that in less than a month the committee was able to prepare its report of such masterly and comprehensive consideration and treatment as readily to constitute the most practical and definite step toward the development in this country of the industries in question. THE REPORTER has been able to obtain a copy of the committee's report so as to present it in full in the current issue, and we urge it for the particular attention and study of our readers concerned in the breaking of our European chemical and dyestuff bondage.

The report treats in logical order the various questions concerned in the establishment of our industries and gives assurance that our natural resources are ample to cover the needs of a complete domestic coal tar chemical industry, inclusive of explosives and dyes, provided there is a certainty of outlet as to volume and continuity which can be assured only by the closest co-operation between the dye-users, the dye-makers and the coal tar distillers, with the initiative on the users. Much stress is laid upon the enactment of an effective anti-dumping clause in the administration of the tariff, to prevent the underselling of domestic manufacturers by unfair methods alleged to be practiced by foreigners. Another specific recommendation is the assessment of a duty on the so-called coal tar "intermediates," which are the basis of the coal tar chemical industry, by one-half of whatever the finished dyes are taxed, and the taxing of all coal tar dyes, without exception, on a uniform basis of 30 per cent ad valorem and 7½ cents per pound specific, since the experience of thirty years had conclusively demonstrated that the present rate of 30 per cent on dyestuffs was not sufficient to induce the domestic dyestuff industry to expand at a rate commensurate with the country's consumption. Once established through a change in the tariff and the additional anti-dumping feature, the industry could develop and ultimately cope with any foreign combination upon fair and equal terms.

The subject of patent laws in the relation to the development of more capable home industries is convincingly treated and the conclusion of the committee is emphatic that proposed changes in the law such as by compulsory licensing or compulsory working clauses are wholly ineffective and are calculated to work more harm than good.

The committee's report covers so thoroughly and convincingly every phase of the subject entrusted to its care that definite action on the conclusions would seem to be in order without further research work. The committee takes the further step of recommending that the report be submitted to the appropriate committees in Congress, as well as forwarded to the interested organizations in the country. The latter can undoubtedly take up the cause from this point and exert their best efforts in helping to perpetuate the work so advantageously launched by the chemical and dyestuff committee of the New York Section of the American Chemical Society.

The authoritative value and significance of this report can be well appreciated by the following outline of the careers of the various members of the committee:

Dr. Hesse was for ten years a research chemist with the Badische Aniline and Soda Fabrik at its German works and in New York, and for the last ten years has been a consulting chemist in New York, specializing in coal tar dyes and the patents relating to them. He was a consulting expert to the Bureau of Chemistry, United States Department of Agriculture, in respect to the formulation of the regulations relative to coal tar dyes in foods under the Federal Food and Drugs Act. He was secretary of the Eighth International Congress of Applied Chemistry.

Dr. Herreshoff, whose family has been prominently identified with yacht building, is one of the pioneer and most successful chemical engineers in the country. He has been engaged in chemical manufacture in and about New York since 1876 and is well known for his successful invention in roasting sulphur-bearing ores, in the manufacture of nitric and hydrochloric acid and of sulphuric acid both by the chamber and contact processes. His method for the electrolytic refining of copper, which is used practically all over the world, has been one of his most notable achievements. He is intimately identified with a great number of leading American chemical undertakings, among them being the General Chemical and the Nichols Copper Companies. He was the first recipient of the Perkin medal, the highest chemical honor in the United States.

Mr. Metz is one of the leading representatives of the dye and dye material industry in the United States and at present is at the head of the Farbwerke-Hoechst & Co., formerly H. A. Metz & Co. He is a member of Congress and on the House Committee on Patents.

Mr. Stone has been prominently identified with the manufacture of coal tar dyes in this country and is president of the National Aniline and Chemical Company, and vice-president of the Schoellkopf, Hartford & Hanna Co., which, since 1879, has been engaged in the manufacture of coal tar dyes, making the company a pioneer in the industry in the country. Mr. Stone read a valuable paper on the "Development of Coal Tar Colors in This Country" at a meeting of the New York Section of the American Chemical Society on October 9, which was published in full in The Reporter on October 12.

Mr. Jayne, as manager of the Barrett Manufacturing Company at Frankford, Pa., has been in close connection with the coal tar industry of the United States for many years. He is the successor of his father, the late Dr. Harry W. Jayne, who was recognized throughout the country as an authority on coal tar and its treatment.

Dr. Matthews has been for many years professor of chemistry at the Philadelphia Textile School, and is a well-known consulting expert to the textile trades. He has specialized in the treatment and dyeing of fabrics and all textile manufactures and is the author of many standard reference and textbooks on finishing and dyeing and coal tar dyes.

Dr. Rogers, as professor of chemistry at the Pratt Institute, Brooklyn, has developed a very practical and thorough system of instruction in industrial chemistry both by lectures and in practical laboratory operations. He is the co-author with Professor Auder of the well-known reference book on "Industrial Chemistry."

The Possibility of Establishing a Complete Dyestuff Industry in America

Address before Society of Chemical Industry

New England Section

Meeting held at Engineers' Club, Boston, November 20th, 1914.

DR. D. W. JAYNE

There has been up to the present time no complete dyestuff industry in America, because hitherto there have been no economic reasons for it. The producers of the crude materials had no excess and no other incentive, and the consumers of the dyes offered no inducement, their demands apparently being met satisfactorily by imports.

Until the advent of the by-product coke oven the production of coal tar increased but slowly, being entirely from plants producing coal gas. The first recovery oven in this country was established by the Semet-Solvay Co., about twenty years ago, though at that time by-product ovens abroad were an accepted fact. Besides this, the coal tar from gas plants has always been a factor abroad, especially in England, where as late as 1900 the gas tar alone was more than twice the oven tar of Germany, and seven times the combined production of both gas tar and oven tar in the United States. The small quantity produced in the United States in 1900 was due to the fact that so many plants here manufactured carburetted water gas, the tar from which is not included in these figures, that the tar from coal gas was and still is an exceedingly small item, and even in 1900 the number of recovery ovens was small—the rapid installation period coming after that date. Europe had many years' start of us, because they began to see the desirability, and perhaps the necessity, of providing outlets for the various coal tar products, while we, up to the present time, have found no difficulty in disposing of those coal tar products which might enter into the manufacture of dyes. As a nation we are not apt to plan far in advance, and the tar distiller did not give much thought to the dyestuffs under the existing conditions. The same condition held true in England, for England has no complete dye industry. Germany developed the coal tar dye industry, using not only its own materials but many brought from England, until it has become one of the most complete industries in the world. The German dye manufacturers have also had every advantage of government aid in their development, and they present a united front to all competition. Here, the construction of by-product ovens has gone on until today about 25 per cent of the coke is produced in them, and still we have not produced a surplus of coal tar products which could be used for dyes.

The products which are the basis for dyestuffs are benzol, naphthalene and anthracene. Benzol and its homologues, toluol and xylol, occur in coal tar in small quantities. The chief source of benzol is the coke oven gases. The Semet-Solvay Co., besides installing the first recovery oven in the United States, also established the first benzol recovery plant in connection with their ovens. They now recover at all their plants, and are the sole producers of that which is available for refining today. Several other oven installations which sell gas to cities do remove the benzol from the fuel gas, but use it to enrich illuminating gas. The Semet-Solvay benzol is also used for enriching at some points, so that it is not all available for refining; but even so, there was a surplus of benzol less than two years ago, and the shortage today would be less marked had it not been for the depression in steel. Few consumers of benzol realize how fluctuations in steel affect supplies of benzol, but with the lessened demand for coke, less coal is coked, with consequently less by-products.

We are already independent of Europe—negligible quantities only of benzol have been imported during the past few years—the price levels here and abroad being approximately the same. The demand abroad is also heavy, due to the use of benzol for motor fuel, especially during the recent high price of gasoline.

Toluol is of more importance to the nation on account of its use in the explosive field than in the manufacture of dyestuffs, and an increase in supplies of benzol brings increased supplies of toluol, which will help the situation in the manufacture of explosives for our national defence.

An increase in benzol supplies will also make it possible to manufacture phenol synthetically. Phenol is today produced in the United States in less proportion to the country's consumption than any of the chemical bodies occurring naturally in coal tar. Our small production of phenol from our tar is primarily due to the small proportion of gas tar produced here, because the tar from coke ovens is deficient in true phenol. England has always been the great factor in phenol, simply because of its large production of tar from coal gas plants.

Naphthalene, the second crude base, occurs in considerable quantities in coal tar. Until recent years the distillate from coal tar in the United States was taken off in only two portions, light oil and heavy oil; the balance, pitch, remaining in the still and the oils taken off to that point which left the correct grade of pitch. This means that pitch was the primary product sought for, and in fact remains so today. This is not to be wondered at, since coal tar yields on the average 70 per cent of pitch, used for roofing, paving and waterproofing; and the American tar distiller began, and has remained, essentially a manufacturer of roofing and paving materials. This is quite different from conditions abroad, where practically their only use for pitch was for fuel purposes, until the advent of its use for road construction, which is of recent date.

Credit is due to the American tar distillers for their efforts in building up a big business for pitch, this 70 per cent of all the tar—and for that reason we make a distinction between the coal tar industry, which is an American development, and the coal tar *chemical* industry, which is exemplified by the German production.

The heavy oil as produced here was sold, just as produced, for creosoting timbers. In it was the naphthalene, and most of the tar acids, notably cresol, and with the ever-increasing demand for creosote oil there was no reason for reducing the amounts available by removing naphthalene from it. Moreover, refined naphthalene has always come into this market at prices so low that it did not pay the tar distiller to remove and refine it. Certainly no more profit could be obtained by so doing than by its sale in the creosote oil, and large plant investment is required for the separation and refining of naphthalene.

Refined naphthalene has been produced here, however, for many years—practically since the beginning of tar distillation in this country—and our present production of it is nearly one-third of the country's consumption. But it is nearly all used as a moth repellent—not any, as far as I know, having been used for the manufacture of any product entering into the dyestuff industry.

Conditions have altered somewhat in the past few years. Specifications have been drawn up for creosote oil which eliminate the lower boiling portion, and now an increasing quantity of middle oil is being separated and the naphthalene and tar acids recovered from it. More naphthalene can be recovered and refined, and no doubt will be, if a demand is assured, at a price commensurate with the added investment and cost of manufacture.

The separation of anthracene from the heavy oil is not now carried on in the United States. About thirty years ago there was a plant which separated small quantities of it for export, but this became no longer remunerative and was discontinued. It is now left in the creosote oil, but the quantity which could be obtained is a much less proportion of the tar than is recovered abroad, because all their tar is run to hard pitch, which is the grade used for fuel, that is, briquettes, while as explained, we run, in the United States, for soft pitch. Thus, some of the high boiling oils containing anthracene remain in the pitch. Some hard pitch is made here, however, and if a steady demand arose at a price commensurate with the investment and manufacturing cost, anthracene could be recovered probably in sufficient amounts for the needs of our dyestuffs.

It is well to remember that less than 10 per cent of tar consists of bodies which can be used for making dyestuffs, the balance being neutral hydrocarbon oils sold, even by Germany, for creosoting purposes only.

It is true we have an American coal tar dyestuff industry. Nearly 20 per cent of our consumption is manufactured here, but until three years ago all the dyes made here were from imported intermediate products; or else were imported in a condition requiring only slight alteration to make them suitable for the trade.

In 1910 the Benzol Products Co. was formed. This company had as a central thought the fact that some day a very considerable amount of benzol would be recovered here, and that it was an opportune time to start operations in order to be ready to take advantage of those conditions when they arrived. Therefore the manufacture of nitrobenzol and aniline oil was undertaken. Thirty years ago the Schoellkopf plant, at Buffalo, had made aniline oil, and more recently the Barrett Manufacturing Co. had tried the manufacture of aniline and toluidine, and had a small plant which, however, had been used almost exclusively for toluidine, as toluol had been a drug on the market, its use for explosives, such as trinitrotoluol, not yet having been started. This previous experience had demonstrated the large part played by sulphuric and nitric acids in the manufacture of aniline oil, many more pounds of acid than of benzol being required for the manufacture of aniline oil; so that in the formation of the Benzol Products Co. the manufacturer of acids was represented. This same condition is evidenced in the plants in Germany, which have built themselves around and in connection with the manufacture of acids, alkalis and heavy chemicals in general.

Since the Benzol Products Co. began it has perfected its manufacturing operations, and no doubt exists as to the quality of the product. The quantity, however, has been limited, primarily, because of the efforts of the foreign convention to nip its operations in the bud, and secondly, because of the shortage of benzol which was felt soon after it was in position to expand. Under these conditions it was deemed unnecessary to sacrifice any more benzol than was necessary to take care of those few buyers who had given visible evidence of their desire to encourage this American industry.

Here we see the attitude of the American consumers of dyestuffs. They were being supplied, at comparatively low prices, with a wide variety of dyes, continually improved as to fastness and new shades. They were buying direct from the representatives of the great German firms; why buy one item such as aniline oil from us, especially as every offer as to price from us was bettered by their present suppliers? In fact, when a 10 per cent duty on aniline oil and salt was secured in the recent tariff, the European convention not only absorbed that duty, but made lower prices than before. There were several notable exceptions to this condition, and among them were several of the American dyestuff manufacturers. They no doubt realized more than the consumer how utterly dependent the United States was on foreign makers for our supplies of dyes. For them we continued to make aniline, but that was not enough encouragement to warrant any expansion, so that the outbreak of the war found us still only manufacturing aniline oil, and not enough benzol in sight to warrant immediate steps to enlarge so that we could at least supply the country's demand on that one item.

The reason why we had not a better established and more complete dye industry years ago was essentially a matter of international economics. The United States had no surplus coal tar products to dispose of, and no incentive in additional profits if it did offer refined products to dye makers, as the intermediate products such as aniline oil, beta naphthol, etc., as well as the hydrocarbons themselves, such as naphthalene and anthracene, could be imported more cheaply than the tar distiller cared to attempt to make them. The manufacturers of dyes themselves had to meet very keen competition. In 1880 there was a sufficiently high duty on these dyestuffs, and no duty at all on the intermediate products, so that at that time the dyestuff industry, based on imported intermediates, began to thrive; but in 1883, the specific portion of the duty on dyes was abolished, and a considerable duty assessed on the intermediate products, and as such intermediate products that far back could not be produced in this country, primarily on account of shortage of supplies at that time, many of the established factories closed down shortly after. There was again a period during which the intermediate products came in free, but the experience was evidently sufficient to prevent any resumption of this industry by the erection of any new plants, and the few factories who have stuck to their manufacture during the varying periods have made but little profit.

The possibilities and prospects primarily depend on the consumers of dyestuffs. Do they want an American dyestuff industry? Are they willing to help pay the price needed to establish it, and if so, will they come forward and say so?

In the first place, there is sufficient coal tar produced in the United States today to give the necessary quantity of naphthalene and anthracene to supply our needs of dyes made from it. Plants to recover them could be erected as soon as plants to use them can be.

Benzol exists in by-product coke oven gases in quantities far exceeding the present needs of both the dyestuff requirements and the trades consuming benzol as a solvent. Efforts have been made, ever since a shortage was seen to be inevitable, to secure the erection of additional recovery plants, but little of the possible supplies can find their way to the dyestuff manufacturer and the other outlets are the controlling factor. However, there seems good reason to hope for partial relief during the next year, at least to an extent sufficient to enable the manufacturers of aniline oil to increase their production. It takes time to demonstrate to the owners of the ovens the advisability of investing in such a recovery plant, especially steel companies in times of depression as have existed, and it takes just as long to get the plant erected after the preliminaries are disposed of.

Any thought of prompt relief in the dyestuff situation is out of the question. We can have the whole complete industry for future use, if the consumers want it, but without a strong plea from the consumers, neither the tar distiller, the manufacturer of intermediates, nor the manufacturer of dyestuffs will risk the large amount of capital necessary.

To establish such an industry, to protect the country from a future shortage, requires one thing and one only—that is, adequate protection. Adequate protection means a higher duty on *all* dyes, and one-half the duty on dyes to be assessed on intermediates, and it also means protection against competitive methods which are aimed to crush and with which we have had experience. This latter protection can probably be best secured by a proper anti-dumping clause in our tariff.

Nothing else is necessary. We have the materials, we have the technical knowledge, we have the capital, we have sufficient unpatented dyes to make nearly everything actually needed, but we need protection.

The need of protection against unfair competition is obvious, but is the need for a higher duty equally so? Bearing in mind that we have no surplus products as yet, it must be made more profitable for the tar distiller to separate and refine the products needed than to leave them as they are today, to be sold in the oils. This means higher prices to the dye manufacturers, and they, therefore, need some offset to enable them to sell their output in competition with the imported dyes. This immediately suggests the thought of the ultimate result on the price of materials if dyed with the higher priced dyes. I have been assured that the price of the dye itself is an absolutely negligible item in most costs of finished goods, and cannot possibly affect the price to consumers, and therefore puts the question directly before the users of the dyes. It is a question for them to answer whether they want an American dyestuff industry independent of Europe and are willing to pay the price to have it.

My personal opinion is that the additional price necessary to be paid by the users of dyes, in order to secure this industry, would not be a permanent increased cost. Tariff protection during the period of development only should be considered. Such an industry would be competing with one of the strongest and richest industries in the world, and competing only on products which are free to all as regards patent restrictions, while the German industry has made vast sums on its products during the life of the patents and continues to reap large profits on those items on which the patents have not yet expired. This means competing on those items which are now sold on close margin and having no exceedingly profitable items which have helped the Germans to earn their immense profits. Protection over a term of years to protect a growing industry has already been given by this Government. The often cited example is the tinplate industry, which was given assurances of a continuing protection for at least ten years, and whose development was immediately begun with that promise. Today it is certainly able to hold its own with anyone. The same would be true of a dyestuff industry.

The initiative lies with the consumers of dyes. Will they make it plain to Congress that they want an American coal tar dye industry?

Lest We Forget! Who Killed Cock Robin? The U. S. Tariff-History of Coal-Tar Dyes

DR. BERNHARD C. HESSE

In 1914 the textile industry said to the chemists of this country:

"The appeal of the textile industry to the chemist at present is: 'We need dyestuffs, so get busy and make them; don't hem and haw, and make excuses, but get right on the job.' "

Again in 1914 the dye-users said to the chemists of this country:

"Users of dyestuffs in quantity are more or less indignant over the fact that manufacturers in this country are dependent upon other countries, and Germany particularly, for the dye supply. They ask: 'Why haven't our chemical companies experimented sufficiently to produce synthetic dyes, pharmaceutical products, essential oils and synthetic perfumes, in the production of which Germany seems to have had almost a monopoly?'

"The users of dyestuffs say that the General Chemical Company, with its cash resources and its extra cash and stock dividends yearly, and other companies in a similar position, ought to have had sufficient initiative to use a portion of their large profits in experimental work, which would have permitted us to manufacture synthetic dyes

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"Article in Journal of Industrial & Engineering Chemistry," without recourse to other countries and would not have permitted American manufacturers to suffer severely when imports were checked by the war. They state that the interests of manufacturers of the country should have been placed ahead of large immediate profits and unusual dividend returns to stockholders."

In view of these statements the following excerpts from the official reports of the various tariff commissions and similar committees, from 1882 forward, are not without present-day utility and interest.

The views of importers, users, economists and domestic chemical and dye-makers are given quite fully; repetition has been avoided as far as reasonably practicable. For fuller information the complete originals should be consulted.

These excerpts show beyond doubt that practically every argument advanced in 1914 as to why coal tar dyes should therefore *have been* made in this country, was previously presented to Congress in support of the view that they *should be* made here.

These excerpts are here presented in the hope that careful study of them by the chemists of this country will pave the way for tariff treatment of coal tar products, inclusive of dyes, on as nearly a fair and equitable economic basis as all the circumstances may require.

REPORT OF THE TARIFF COMMISSION, 1882

LONG BRANCH, N. J., July 26, 1882.

VOL. I—PP. 154-6. MR. JOHN CAMPBELL, of New York City, a member of the firm of J. Levinstein, Campbell & Co., manufacturers of aniline dyes, appeared in response to the invitation of the commission and made the following statement:

GENTLEMEN OF THE COMMISSION: We are importers and manufacturers of aniline dyes. We pay from 5 to 300 per cent duty on the different articles which we import. Our goods are used by paper-makers, manufacturers of woolens and other textile materials, and in nearly every class of industrial pursuits. We are the third largest aniline dye importers in this country, and pay annually duties amounting to nearly $100,000 upon the dyes we import. The duty now is 50 cents per pound, and 35 per cent ad valorem upon aniline dyes and colors, by whatever name known. With the exception of four small firms in the United States, who only manufacture two or three colors, out of two or three hundred imported, and who altogether do not employ more than fifty men, these dyes are all imported from Germany, England, France and Switzerland.

As I have said, these colors enter into the consumption of nearly every manufacturer of textile fabrics, paper, leather, silk, ink, matches, soap, printers' and innumerable other trades. They cannot profitably be made in this country for various reasons: First, the raw material is here in only very limited quantities; second, the acids and other chemicals used for making these dyes are not made here; third, the skilled chemists who have grown up with this particular branch of industry are very few and are all engaged in Europe.

In every country in Europe, and even Canada, these goods are upon the free list. There is one dye, wool scarlet, a substitute for cochineal, which bears a duty of 135 per cent, while cochineal, the article it is a substitute for, is admitted free. This means a tax upon every 100 pounds of woolen or worsted yarn, dyed scarlet, of from $1.50 to $2, and to every manufacturer of hosiery (shirts and drawers knitted), 25 cents per dozen of shirts.

This compound duty of 50 cents and 35 per cent is a very unequal tax, as the bulk of the dyes are only worth abroad from 50 to 60 cents per pound, whereas at the time this duty was levied, scarlet dye was unknown, and the dyes then imported were worth from $2.50 to $10 per pound in Europe. I doubt if a single consumer of these dyes would advocate the retention of this portion of the tariff. I am in favor of the free importation of these goods, but still, if a duty be requisite for revenue, then I say make it ad valorem instead of specific and ad valorem, as the 50 cents per pound alone means upon some of these dyes 240 per cent duty, while upon others it means only 5 per cent.

I have no means of getting at the exact quantities imported into the United States, but from a list of the imports recorded in the *Oil, Paint and Drug Reporter*, which I take to be fairly accurate, I find that from January 1, this year, to June 30, there were 532,000 pounds of aniline dyes imported into the city of New York, so that it would not be far from a correct estimate to place this year's imports into the United States at a total of 1,500,000 pounds, paying a duty of $1,500,000. If these goods are placed upon the free list it will go a long way towards enabling American home industries to compete successfully against foreign manufactures in foreign markets.

The three largest importers of these dyes are William Pickhardt & Kuttroff, of New York, agents for the Badische Aniline Company, of Stuttgart, Germany; Lutz & Movius, of New York, agents for Meister, Lucius & Brüning, Hoechst-on-Main, Germany; and ourselves. Our works are at Blackley, near Manchester, England.

These three firms import more than half of all the aniline dyes brought to the United States, while the remaining half are distributed between about twenty other firms.

Aniline dyes, although a manufactured article, are really and substantially, to the American consumer, a raw material. There has been, since the tariff was last framed, quite a revolution in this trade, which has brought them from the category of a luxury to a necessary and essential product, of great importance to the industries previously stated.

All the large carpet manufacturers use these goods, and the tariff is quite unequal. When it was first framed the duty was 30 to 40 per cent, but now the duty is 300 per cent very nearly on some of the articles.

By the PRESIDENT:

Question. Will you please state what the dyes you have referred to are made of, and whether they are manufactured in England any better than we could possibly manufacture them here?—*Answer.* Aniline dyes are manufactured from coal tar, or gas tar it is called in England. In England they are produced more extensively than here, for one reason that the material is not found in this country in such abundance as it is in England, and for the several other reasons before mentioned. I understand that the coal found in this country does not contain so great a percentage of the light hydrocarbons as the coal found in England, therefore these dyes cannot be made here at such profit. In Germany and France they import their raw materials largely from England. Manchester is the center of production for aniline. There are four large firms engaged in the manufacture in Germany, two in France, and a few in Switzerland. The raw material at our command is not sufficient or cheap enough to enable us to make them at a profit at present, but if the duty is put up pretty high we will erect works and manufacture some of the dyes here ourselves. If the duty is taken off, this branch of industry will remain as it is at present.

Q. I would like to ask you as to the aniline dyes that are made in this country—whether their quality is good and whether you are limited to one color?—*A.* There are three colors made in this country. One is magenta, the raw material for which is imported from England. It is manufactured here and sold at a fair price, but the quality is not such as to enable it to compete with the imported article. The firm which manufactures it is located at Albany, N. Y. I do not think they employ more than about forty men altogether. There are three other concerns, employing a dozen men. That is the extent of the manufacture at present. They do not compete with the foreign goods at all.

Q. What amount of these goods are used by the different manufacturers of colored prints, for example; I mean of these aniline dyes?—*A.* I cannot tell you exactly the amount the different manufacturers consume, but the quantities imported last year were about 1,200,000 pounds, paying a duty of $1,200,000. These dyes take the place of almost every color. Cochineal has been generally used for dyeing woolen goods, but wool scarlet is used as a substitute for cochineal, which comes in free, while this has to pay 135 per cent duty. They replace also archil and other barks, woods, and extracts used for coloring purposes. This whole trade is yet in its infancy. The blue article that I introduced into this country enters into the manufacture of all the paper used by the New York dailies. It sold then at $4 a pound, and it took the place of ultramarine. All the paper-makers use it. Among the consumers of aniline dyes I might mention the following: All woolen manufacturers, who use it in the manufacture of bed-blankets, horse-blankets, carpets, shirts and drawers, flannels, hosiery, domestic woolen yarns, worsted piece goods, merinos, ladies' opera flannels, wool hats, overcoatings, etc. It is also used in the manufacture of dress goods, both woolen and cotton; ginghams, prints, and cotton yarns. It is also used in all classes of paper manufacture, not only for newspapers, but for paper used for wrapping purposes, for posters, envelopes, and wall paper; also in the manufacture of straw hats, willow and wicker work, leather for chair covers, and for printing inks, especially by all label press printers, and by matchmakers and jute-carpet manufacturers.

LONG BRANCH, N. J., July 26, 1882.

Mr. JOSEPH WHARTON, of Philadelphia, representing the nickel interest, appeared before the commission in response to its invitation and made the following statement:

VOL. I—P. 205. * * * * * * I also know something about aniline dyes, because I was invited to go into that industry, and had occasion to examine it at the time. I declined to go into it because I had so many other kinds of business on hand. The idea that we have not in this country the material for manufacturing aniline dyes is absurd. A small fraction of the waste of our gas-works would make all that the country wants. There is a lack of skill here to produce the dyes, and a certain amount of danger to life in the process of producing them. They are mostly made by the use of arsenic, which makes poisonous compounds, sometimes destroying the lives of healthy workmen, and perhaps destroying the lives of the persons who use aniline-dyed carpets or live in the rooms where the walls are covered with paper colored with aniline. But there is no trouble about the making of aniline dyes in this country. I think it is an industry that should have every measure of encouragement that the Government sees fit to give to other industries. * * * *

LONG BRANCH, N. J., July 26, 1882.

VOL. I—PP. 207-8. Mr. HENRY BOWER, of Philadelphia, made the following statement before the commission in regard to the subject of aniline dyes, in addition to his former statement on the general subject of chemicals, given on the 22nd of July:

I would like to make a short additional statement on the subject of aniline dyes. Some time ago, while this whole question was being discussed in a public way, I received a letter from Mr. H. K. Lansing, the treasurer of the Albany Aniline and Chemical Works, relating to this subject, which I will take the liberty of reading. It was as follows:

ALBANY ANILINE CHEMICAL WORKS,
Albany, N. Y., February 8, 1882.

DEAR SIR: We desire to inform you that the manufacture of colors (aniline) commenced in this country, we think, in 1866 by T. & C. Holliday, who subsequently sold out to the Albany Aniline and Chemical Works, a company incorporated in April, 1868, with a capital of $25,000, and increased to $100,000. After expending all their capital on machinery and experiments in the manufacture of fine aniline colors, they reduced the capital to $25,000, and confined their attention to the production of aniline red until about two years ago, when new premises were purchased and some $60,000 expended for machinery. Chemists were brought from Switzerland and England, and we are now engaged in the manufacture of all the fine aniline blues, and expecting ere long to make all the finer colors made in Europe. As an illustration of the benefit the country has derived from our efforts, we can state that large crystals of red were sold in 1868 at $6.50, gold. We now supply the trade with an acknowledged better color at $2.50 per pound. Blues were sold one year ago at $4. Since we commenced making the price has dropped to $2.50. We think we deserve the sympathy and encouragement of the powers that be.

Very respectfully yours,

H. K. Lansing, *Treasurer.*

I will state that I have notified Mr. Lansing of the hearing that is going on before you, and he will appear in person and make a statement on this subject.

I desire also to add that it appears that in 1880 there were 563,932 pounds of aniline dyes of foreign manufacture, of value, with duty added, $1,600,166.48, entered for consumption, while during the last census year only 80,518 pounds were produced in the United States, in value amounting to $107,282. These figures are the most exemplary that can be given to show the depressing effect on an industry of an unpremeditated reduction of duty. Had the other 50 cents per pound been allowed to remain, the position of aniline dyes would doubtless have been about the same as licorice and borax, and the country would have been independent in this regard. Not only has the reduction of this duty prevented the manufacture from growing, until quite recently, but the danger of having another 50 cents per pound lopped off has naturally aided in hindering it, as one house sank $50,000, another $30,000, to my knowledge, following the reduction.

I am informed that the manufacture of aniline dyes in Europe is practically controlled by an English monopoly, which buys a large amount of material for this manufacture in this country, sending it to Germany and Switzerland, where these colors are produced by the poorest paid labor in Europe, and shipped to England and America. Already an extensive English house has made overtures to parties in this country, looking to the control of these products, and thus to deprive us of the raw material after present contracts have expired. I could name other articles of chemical manufacture which are held in about the same prospective condition if the large European combination should suceced in breaking through the barriers of our protective system.

LONG BRANCH, N. J., July 26, 1882.

Mr. EVERETT P. WHEELER, of New York, representing the New York Free Trade Club, appeared before the commission, in response to its invitation, and made the following statement:

VOL. I—P. 223 * * * * I use in illustration of this the facts stated by Mr. Campbell, in regard to aniline dyes. It was shown by him clearly, and I think there is no dispute about that, that the cheapening the cost of production of these goods abroad has not benefited to the extent it ought the parties in this country who use them, because the duty being a fixed one of so much a pound, instead of being based on a sliding scale, the price has been kept up instead of being diminished. And, as a consequence, all of us who use printed goods of any description, or paper of any description, have to pay more in the long run than we otherwise should have done if the manufacturers could have bought a cheaper dyestuff.

P. 229 * * * * * Why should not, then, the third class of wools, the heavy wools, be put on the free list? That certainly would be a great benefit to the carpet manufacturers of America; and if this other suggestion made by Mr. Campbell to you should be carried out, and these aniline dyes should be put on the free list as well, the production of American carpets would be cheapened to such a degree that they could compete with great success in the South American market and in other markets. The goods we make are good in quality; a great deal of money is expended in designs for them, and I think any one who has examined the American carpets of recent make has been astonished at the amount of taste shown in the designs. * * * *

P. 230. Let me make just one suggestion on the question of dyestuffs. I want to call attention to the census bulletin in regard to the manufacture of chemicals. You will observe in regard to these dyestuffs that they have almost entirely displaced vegetable dyes. The duty in many cases amounts to more than 100 per cent ad valorem. Even if it were possible for us in this country to prohibit for the next ten years the importation of these colors, would it be a wise policy for us to do it, considering the extent to which you have been shown they enter into all manufactured goods? Would it be a wise policy for us to build up a manufactory of aniline dyes in this country when they can be made more cheaply abroad because the raw material is found in a cheaper condition in England? The English coal, as everybody knows, is richer in the hydrocarbons or inflammable matter than our American coal, and it is well known that we do import to some extent English coal to make gas, although the duty on it is a high one. The only objection that has been or could be made in regard to that would be that if we got into a war with some of the European countries we should be at a disadvantage in regard to these colors. I suggest that that is a very contingent and remote disadvantage: that the probabilities of such a war are insignificant. These goods are made not only in England, but in Germany, and if the worst came to the worst, and we were cut off from our European supplies, we could fall back on the vegetable dyes that came from South and Central America before aniline dyes were invented. * * * *

PP. 236-237. In regard to one suggestion which was made, which goes to the whole root of the matter, that it was the object of the Government to lay a tax to enable people to do a business which would be profitable, which otherwise would not be profitable, I will say this: Where that applies to large amounts of money invested, that is one thing; but where it applies to a creating of a new business that is not necessary and that the country can do without, we should pause before committing ourselves to that proposition. If there were an embargo, and we could not import anything, I suppose all sorts of industries would spring up here at once. In regard to the aniline dyes, it was said to be a poisonous business, and the people engaged in it suffered very much on account of the poisonous materials used. If that is so, why should we desire to build up a business of that kind? The gentleman from Albany, Mr. Hendrick, spoke of a 35 per cent ad valorem duty. Certainly, in the present condition of that business, considering the existing rate, I should not contest that proposition, so far as the aniline reds are concerned; I should not oppose, but consider it just to put the duty at that figure. But I should object to keeping all aniline dyes at the rate of 35 per cent so that Mr. Hendrick might be enabled to build up a new business for the purpose of increasing the cost of all articles that are made with those dyes.

LONG BRANCH, N. J., July 27, 1882.

VOL. I—PP. 253-256. Mr. JAMES HENDRICK, president of the Albany Aniline and Chemical Works, Albany, N. Y., appeared before the commission, upon its invitation, and made the following statement:

The history of our business is simply this: In 1866 my attention was called to the manufacture of aniline dyes, and I considered it a legitimate manufacture in this country which ought to be developed. Some gentlemen associated themselves together and we purchased the establishment of T. & C. Holliday, the only establishment of that kind then in this country, and began the manufacture in Albany of this article, putting in at first about $25,000 and subsequently increasing the amount to $100,000. We lost that amount of money and $50,000 additional in the business. In 1872 I took personal charge of the manufacture, and, applying to it practical business principles, found it could be made a success in certain directions. I emasculated everything from the manufacture except the article of "aniline red." We continued the manufacture of aniline red for seven or eight years and made an article, acknowledged by all manufacturers in this country, as well as those who know of it in Europe, to be equal to anything made abroad. The price of it at that time was $6.50 in gold. We are selling it now at $2.25, and are supplying the manufacturers of New England, and today they are giving us orders for more than we can make of it. As I presume you are all aware, all these aniline colors are made from an oil procured from coal tar—the benzole made from coal tar. We have been obliged to import that because of the difficulty of getting it in this country in large enough quantities to distill it. We have been importing all of this oil that we required, but now we are manufacturing it a little. I have in my pocket a sample of aniline oil manufactured from benzole, which is, in turn, manufactured from the residuum of petroleum. I have also a sample of cloth dyed with the various colors that we make ourselves. These dyes we make in our factory, but not in large quantities. We are putting up machinery now which will enable us to manufacture on a larger scale.

The Pacific Mills and other like manufactories in this country express the strongest hope that we shall receive from you the encouragement we are entitled to. In a letter addressed to me within a week by Mr. Saltonstall, the treasurer, he said there were some importers, or the agents of foreign color companies, going through the mills in New England, expecting to get a petition signed in favor of the reduction of the duty on aniline colors, and he said they would have no sympathy from them and cautioned me against them. I have no doubt you will have an application to this effect. I have not come here to tell you what you shall do. I can only point you to the evidence we have of what we have done in our little way toward reducing the price from $6.50 to $2.25, and we propose continuing that warfare. We have not made a large amount of money, and every dollar we have made we have spent in improving the manufacture of these colors, so that the investments we have made from the year 1866 up to the present time have not yielded us 1½ per cent on our money. But we are developing the business we have helped to create and the country is getting a benefit. I will leave you samples of these colors I have referred to.

By Commissioner AMBLER:

Question. As I understand the matter, this is the product you obtain from the residuum of petroleum, and you are still continuing your experiments endeavoring to extend the number of colors to be made?—*Answer.* Yes, sir.

Q. I do not understand that you now make a multitude of colors, so as to be able to put them on the market?—*A.* Not all of them. We are manufacturing the colors I have exhibited.

Q. From these experiments which you have made you think you can make a variety of colors, and are putting in the machinery now for that purpose?—*A.* Yes, sir.

Q. It has been suggested here that the raw material for making these colors is not obtainable in the United States. Is that the fact, and, if so, what is the cause of it?—*A.* It is a fact, for this reason: That, as I endeavored to explain, the gas tar was not gathered in sufficient quantities in this country to make the benzole, and the expense of distilling benzole into aniline oil has been too large for any party to engage in it. But there are two parties now making benzole, the New York Coal Tar Company and one other, and they are exporting benzole, and we are importing the oil. If we get the oil industry started, as we expect to do, we shall not be dependent on foreigners for our oil, but they will be dependent on us.

Q. Have you taken any steps towards producing this aniline oil?—*A.* Yes, sir; contracts are out for $35,000 worth of apparatus with which to manufacture it, and I have a chemist here from France to superintend the work.

Q. How long have you been making these other colors? I do not mean the aniline red.—*A.* Not more than about two years.

Q. Are there any other firms in the United States engaged in the manufacture of these aniline colors?—*A.* There are three or four, I think. There is the firm of T. & C. Holliday, in Williamsburg, N. Y.; another one in West Virginia, and one in Buffalo, N. Y. Those are the only three I know of; I have heard of others.

Q. Up to this time, as I understand you, this has been an unprofitable experiment?—*A.* I cannot say that; but we have been spending a large amount of money.

Q. Have you been able to make aniline red at a profit? *A.* Yes, sir; we have been making it at a profit, but all the profit we have reinvested. We have upwards of $250,000 invested in the business in buildings and machinery, and this will be the result of the profits for the last ten or twelve years.

By Commissioner KENNER:

Q. Are these colors fast colors?—*A.* They are as fast as colors can be made. All aniline colors are a little fugitive; that is to say, the sun will fade them somewhat. All the red garments you wear are made from them, every one of them. We have everything in this country that is necessary to manufacture aniline dyes. We have brains enough to do it; and I think we are as able to make them as any foreigner is.

By Commissioner AMBLER:

Q. I am requested to inquire of you (and your answer can be given now, or hereafter, in writing) what you would regard as a sufficient duty for the protection of your manufacture?—*A.* My individual opinion would perhaps be of no more value than the opinion of any other person. We do not want to make a great fortune by large protection. I think, perhaps, that a fixed duty of $1 per pound would be preferable to the duty of 50 cents per pound and 35 per cent ad valorem.

Q. Would not that operate very unequally in this respect, that some of these colors are very much more expensive to produce than others?—*A.* Yes, sir.

Q. Have you any remedy to propose as to that; that is, can you suggest any mode of making the rates equal? *A.* No, sir; if I were to suggest a plan I should say let well enough alone; let the business go along until it is better developed, and it will regulate itself by and by. I believe the great curse of the country today is change in these laws; and I think the less we change the tariff, as it affects commercial and manufacturing interests, the better. It is a trite saying, attributed to President Lincoln, that you should never swap horses when crossing a stream. I think that principle should apply in this case, and that when we are trying to develop a business it is not well to change the laws affecting it too often.

Q. It is complained that this is an unequal duty. The only purpose I had in asking the question was to ascertain whether you had anything to suggest which would make it an equal duty; and I now ask you specifically, would an ad valorem duty, at a proper percentage, be a fair duty? *A.* It would if you could get at the ad valorem; that is the great difficulty. The manufacturers on the other side of the water are exceedingly smart, and they will tamper with colors, and represent one color to be a different color; and the difficulty is in getting competent men who know the value of an article, and will place the true ad valorem on it. I have heard of expensive colors being introduced under a new name in order to get rid of the duty. Therefore, I say the other way is the more equitable method.

By Commissioner GARLAND:

Q. I understood you to say, in regard to the supply of the raw material, that you were importing it from abroad? *A.* We have imported all the raw material of which we make these colors, and are doing so today.

Q. Is there not enough material in this country, if it was collected properly, to furnish the supply, or what is the difficulty?—*A.* The difficulty has been that it was not profitable to go into that branch of the business. The tar yields ¾ to 1 per cent of benzole, both the American and the English tar.

Q. Is the English tar better adapted to the purpose? *A.* It is one-eighth of 1 per cent richer, that is all. But we think the American tar would be quite as good, the only difficulty is in getting it together and carrying it from one place to another, which would add to the cost of transportation.

Q. Then I understand there is enough of that material in this country, but the difficulty is in getting it together? *A*. Yes, sir. Even if this product of petroleum fails, which I think it will not do, there would be an abundance for our own use and that of Europe besides; I mean of the benzole extracted from tar.

By Commissioner McMAHON:

Q. If it should be decided to apply an exclusively ad valorem duty, what rate would you recommend?—*A*. I think about 35 per cent would be fair; that is my impression about it. I should make as few changes as I could.

By Commissioner UNDERWOOD:

Q. Would it be possible for you to furnish the commission with a schedule of duties on these different articles which would enable the Government to collect duties without ambiguity and the commission of fraud?—*A*. Not unless you can make men perfectly honest. If we had honest men everywhere, there would be no trouble. There would be no difficulty in enforcing such a schedule in case men did not resort to dishonest practices. In that case I think 35 per cent would be about a fair rate. I think we could live if it were fixed at that figure.

By Commissioner BOTELER:

Q. You think specific duties are better for the Government and for the parties concerned?—*A*. Yes, sir. Specific duties I believe in, because they are easily collectible, and men have no disposition to be dishonest; but with ad valorem duties the temptation to fraud is greater. That is my view of that matter. I will leave you these samples that I have referred to in my statement, and, if you desire, I will give you any further information I possess, from our books or in any other way.

LONG BRANCH, N. J., August 21, 1882.

VOL. I—PP. 565-568. The following communication, regarding duties on aniline dyes and coal tar products, was received from Mr. V. G. BLOEDE, representing the American Aniline Works, of Parkersburg, W. Va.:

GENTLEMEN: Having found it impossible, during my recent hurried visit to New York, to accept your invitation to appear in person before your committee, I adopt this method of communicating my views upon some of the matters you now have under consideration.

The firm of Bloede & Rathbone, of which I am a member, is engaged at this point in the manufacture of various chemicals, chiefly such as are used in the dyeing and printing of yarns and textile fabrics. Our firm is also largely interested in the business known as the American Aniline Works, and it is particularly in this line of manufacture that I feel competent to communicate important information to your committee. The production of aniline colors from our native crude materials is a business, the benefits of which seem to me to belong most legitimately to this country, and forms a fitter subject for heavy, even prohibitory, duty than many other branches of trade depending exclusively upon imported crude material. Strange to say, although we have all of the chief crude materials in this country, it is only within the last two or three years that the production of colors exclusively from our native products has been attempted. Prior to this time a few small works had been engaged in the manufacture of a few simple coal tar dyes, but they worked exclusively with a crude material, combined and manipulated by European skill and imported into this country, duty free, in a half finished condition, *i. e.*, in the form of arseniate of aniline. To produce this material, American benzoles and other coal tar products are shipped abroad in a crude state at a heavy expense, manipulated by foreign skill and labor at another heavy expense, and returned to us still as a crude product, but largely enhanced in value. The entire profits of manipulating our own crude material have thus for years been lost to our country. I believe I am correct in stating that the American Aniline Works, which I have the pleasure of representing, was the first concern in the United States which succeeded in producing on a large scale the base used in the manufacture of these colors, *i. e.*, aniline oil, from the crude coal tar products of our own country, and exclusively by home labor. It is not necessary for me to dwell upon the almost insurmountable difficulties encountered in a new manufacture of this kind in a country totally devoid of skilled labor and experience. It generally means one of three things: first and generally, a total failure; second, the importation of skilled labor from the other side (a class of labor which seldom flourishes under the business conditions here existing), or, as the American Aniline Works have done, the ***redevelopment,*** as it were, of the entire process of manufacture by a long series of difficult and costly experiments. One thing that is retarding the utilization of our home products more than anything else is the fact that, by the grossly unjust and arbitrary provisions of some sections of our tariff, aniline oil, and the half finished product known as arseniate of aniline, have been hitherto admitted free of duty, a provision wholly and exclusively to the benefit of the foreign producers. The natural result has been that no American manufacturer could be found willing to devote his time and capital to the development of a branch of industry in which Europe has the advantage of twenty-five years' experience. To insure the utilization of our own coal tar products under the best possible conditions for success, I would most urgently request that your commission recommend a duty to be placed upon the two crude materials named, as well as any others that can be produced here, so as to insure to our country the benefits derived from the consumption of our own coal tar products. In my opinion, had our tariff not been defective in this vital particular, and aniline oil and its compounds had early paid duty, the manufacture of the articles from our own crude coal tar products would have been an assured fact years ago. I believe that our people are fully competent, not only to hold their own against the competition of other nations in any manufacture, but that they are their superiors in many essential particulars. At the same time it is absolutely necessary that a new enterprise of this kind, in order to compete successfully against the products of a quarter of a century of European research and experience, be liberally protected until our own manufacturers have acquired sufficient knowledge and experience to enable them to hold their own against these odds. I would therefore urge that aniline oil, arseniate of aniline, and other salts of the base be protected with a specific duty of from 5 to 10 cents per pound. I would also urge that the duty on the intermediate products, such as nitrobenzole, and binitrobenzole, and its homologues, be maintained. The duty on nitrobenzole is now 2 cents per pound, while binitrobenzole, which is merely nitrobenzole combined with more acid, pays a duty of 20 per cent. I would recommend that the duty upon all nitro compounds of benzole and its homologues be made a uniform one of 10 cents per pound, as in the case of nitrobenzole.

I have carefully examined some of the statements made before your commission, and must say that some of those presented on behalf of the foreign manufacturers are certainly extraordinary misstatements of facts. Mr. John Campbell, for instance, appeared before your commission, and, unless the press misrepresented him, made the remarkable and wholly erroneous statement that a color costing $1 per pound in England would, under the present duties, cost $4 per pound laid down on this side. This is such a very gross misstatement of the facts that I hesitate to believe it was seriously offered to your commission. Such a color as Mr. Campbell speaks of, after payment of all duties, freights, and the like, would cost less than one-half that sum, say $1.90 per pound. The result of home competition is already so strongly felt in some lines, for instance fuchsine and other reds, as almost to have stopped all importations, and it is my opinion that within a short space of time these colors can be made as cheaply in the United States as in any country of Europe. This is the direct result of protection and the stimulation of home enterprise, and there is no reason whatever why, within ten years, or even a much shorter period, if we are only able to avail ourselves, by means of a liberal protection, of our domestic wealth in crude material, all other coal tar colors should not be in the same position.

Whatever course your committee may take as regards the older chemical industries of this country, I would urge that the aniline branch be liberally protected at least for a few years. As before stated, it is an industry so new that up to two years ago not one pound of the base used in the manufacture of these colors was made in the United States.

A great deal has been said, and with much force, upon the nature of the duties imposed on aniline dyes, and the injustice resulting therefrom. A duty like the present one, of 50 cents per pound and 35 per cent ad valorem, I believe to be wholly wrong. It annually deprives our Government of thousands of dollars of legitimate revenue, and entails an enormous and unnecessary expense in collection. Many of the manufacturers on the other side have resident partners here, and it is the general impression that an enormous amount of color finds its way into this country under the ad valorem system at a very great undervaluation. That this system of collecting duties at least opens the way to a great deal of fraud will be seen at a glance by your commission, when I state that the various aniline blues, for instance, range in price from $2 to $15 and $20 per pound. The difference is not one of strength, but only of purity and quality of shade, some high-priced colors being actually weaker in point of strength than others of a low price. These colors are sold under arbitrary names and marks, such as B, BB, etc., up to 5 B or 6 B. Now, suppose an unprincipled person wishes to undersell his competitor, all that he has to do is to mark his 5 B, or 6 B, or other mark, worth, say, $12 per pound, down to B or BB, worth, say, $3; the result is the evasion on his part of 35 per cent duty on $9 of each pound of this color, or the enormous sum of $3.15 on every pound. It is utterly impossible for the largest corps of experts the Government can command so to test the samples as to make such frauds impossible. The interests of the Government, the consumer, and the honest dealer, require a change of this system to one of *specific* duty, or so much per pound of color. The average value of the aniline dyes imported into this country we will say is $6 per pound. Under the present system, such a color would pay a duty of $2.60 per pound, and I would recommend that a uniform duty of from $1.50 to $2 per pound be imposed upon all aniline dyes of whatsoever name or quality. While it is true that such duty would be prohibitory as regards the cheaper grades, the answer to this is, that such dyes can and are already produced in this country at a price to exclude, or almost exclude importation, even under the present system of duty. By adopting a specific duty a large expense would be saved the Government in the collection of the duties, a larger revenue would result, the consumer would be largely benefited by the higher grade of the colors, and honesty on the part of the importer would be insured, as it would necessarily break up the system of undervaluation, or cost invoicing, adopted by many of the European manufacturers having resident partners on this side. Should an ad valorem duty be continued, I would urge your committee to move a Congressional investigation having for its object the breaking up of the system now in vogue for the evasion of duty.

Some efforts have been made to show that the present rate of duty on these dyes is very onerous to the consumer and the public; such is not the case, however, for two reasons: first, because the branches of business consuming them are themselves protected by almost prohibitory duties, and lastly and chiefly, because the quantity of dye used per pound of cloth or yarn is almost infinitesimal. Taking the case of fuchsine, for instance, a color costing only $2 per pound, but four or five ounces are required for every 100 pounds of carpet-chain; this means a tax through present duties of only 3 or 4 cents on an average size rag carpet. The fact is that while a removal of the duties would deprive the Government of a large revenue, and kill the home industry outright, no one class, except the foreign manufacturer, would be benefited. This was shown a few years ago in the case of artificial alizarine. By the assistance of the consumers the duty was removed from this article, ever since which time the said consumers have to pay about as much again for the article as their foreign competitors, and the large revenue that would have resulted to our people by a duty was absorbed by the foreign manufacturers and their agents. It is therefore desirable that neither the Government nor the consumer be again inveigled into such action on behalf of a wholly foreign industry.

Before closing I would call the attention of your committee to the fact that, owing to the vitality the American aniline manufacture is beginning to show in the last year or two, the foreign manufacturers of these dyes have combined for a concerted action, and are making extraordinary efforts looking to the repeal of the duties and the killing of this promising industry. Among other devices adopted, is the one of obtaining signatures to petitions among the consumers of these dyes, asking for a repeal of the duties. These petitions have been gotten up by the New York representatives of a large foreign corporation, and are being extensively circulated for signatures. I state this so that when such petitions are presented it will be understood that they are not the sentiments of the American consumers of these dyes, who, as far as my knowledge enables me to speak, are *universally* in favor of and willing to pay their quota towards the successful introduction of this manufacture in the United States. The actual disposition of the largest consumers of the anilines is fairly represented by the following sentence in a letter recently received by me from one of these consumers: "The representatives of a large European aniline works are making a great push to have the duties on anilines reduced. I inclose you their circular which they are sending to all the manufacturers to obtain signatures. What do you as a manufacturer think of it, and what would you propose? We can stand it as it is, and, having all the protection we need on our manufactures, are willing to give all that is required to others."

I have the honor of remaining,

Very truly yours,

V. G. Bloede.

Parkersburg, W. Va., August 10, 1882.

Boston, Mass., August 24, 1882.

vol. i—pp. 661-663. Mr. Henry A. Gould, of Boston, refiner of camphor and manufacturer of aniline dyes, addressed the commission as follows: * * * *

I hope that the commission will be able to recommend a reduction of the duty upon aniline colors. The duty now, as you well know, is 50 cents a pound specific duty, and 35 cents a pound ad valorem. I represent a house in Germany, with a capital of $10,000,000 or $12,000,000, and we sell the goods in the original package in this country. I have reason to know that the duty is so high that it leads, in the first place, to corruption and misrepresentation of goods brought into this country. Without desiring to make any definite statement, I may say that I feel that goods are, owing to this high duty, often brought in on a wrong valuation in many respects. The argument on this question has been gone over before you very fully by Mr. Campbell, but I may say, in brief, that a duty of 20 or 25 per cent would answer all the purpose of protection, as I have instanced in regard to the matter of camphor, and would help the manufacturer, without being a burden on the manufacturer of textile articles. I paid a visit to South America last summer, and while there could see the reason why they imported their goods from England rather than from this country. The 3 or 4 per cent which is added on to the cost of American goods by reason of this heavy duty on the raw materials used in their manufacture is the cause of it. Our house in South America imports hundreds of packages of goods from Manchester and other sections of England that we should import from this country if the prices were lower. Of course, every tax of this kind that is added to the original cost of the goods acts as a prohibition upon trade from this country. We have a house in South America for which we import largely from England. The freights on goods exported from this country to South America are much larger than they are on goods exported from England, and, of course, the percentage of cost for these pigments and colors adds very largely to the cost of the print or the manufactured article.

I think a moderate duty would do away with the tendency to undervalue these colors when they are imported. At the present rate of duty it is certainly a very great temptation to fraud.

By the PRESIDENT:

Q. How much does the duty on aniline colors affect the price of the ordinary American prints, for instance?

A. I am not prepared to answer that question exactly: but I know that we have very carefully prepared tables showing the cost of prints imported from Manchester and the cost of prints and other colored goods made in this country, and the difference is considerable; and, of course, as you can see, every additional tax on the manufacturer adds to the cost of the manufactured article. A duty of 25 per cent would answer all the purposes of protecting the American manufacture of aniline colors, as I have instanced in the case of camphor, without adding as heavy a tax to the user of aniline colors. As Mr. Campbell has said, there are from one to two million pounds of colors, representing millions of dollars in value, imported annually into the country, but yet the business is in its infancy. I imported in 1866 the first aniline colors ever brought into this country.

Q. What colors were they?

A. They were blues and reds. I had very hard work to dispose of my first consignment of 1,000 pounds; it took me nearly six months to do it. But in the next six months I sold from $50,000 to $75,000 worth, and the business has increased very rapidly ever since. I am satisfied we cannot manufacture these dyes in this country as well as they can abroad, unless there is a change in the prices of labor and in other particulars. In Germany laborers are paid from 60 cents to $1.12, while the same laborers in this country receive from $1.50 to $2.50 a day. Alcohol is very cheap in Germany, while here it is loaded down with taxes. Nitric acid there is cheap, while here it commands a very high price per ton. And so I might go through the whole catalogue and name the elements that enter into the production of these colors. I should be very glad to see them made in this country, and even as an importer would readily submit to a fair rate of protection in order to develop that industry. There are only three or four companies in this country manufacturing these colors, and with every advantage of protection they have kept the price up as high as the tariff would allow them to, and made the manufacturers pay a royal price for their colors, and the textile manufacture has not been benefited by it, and they never have been able to make one or two of the last colors. My house, in Germany, manufactures some two hundred colors, while such concerns as the one in Albany, the one in Buffalo, and one or two in Philadelphia, manufacture only one or two colors. There are a dozen companies in Europe having a capital of from $12,000,000 to $15,000,000, some of them; even the smallest of them have at least a million dollars capital, and in that way they can manufacture to very great advantage. I am speaking now of aniline colors, without reference to alizarine, for that is a monopoly under a patent.

Q. Is the price of alizarine due to the high tariff?

A. No, sir; it is a free article; it is due to the control by one house of the patent under which it is made; it is a monopoly. We represent a manufacturing house in Austria which makes it, but we are prohibited selling it in this country, under a decision given by Judge Lowell. The decision is regarded in Europe as unsound, but nevertheless we have to abide by it.

Q. How much lower are the European users able to buy this alizarine than American users?

A. I could not answer that question, because since we were enjoined from selling the article I have not followed the price of it. I only know that after the decision of Judge Lowell the manufacturers here raised their price over 100 per cent in a very few months.

The PRESIDENT. I wanted to bring out the fact that the high price of alizarine, one of the most important of the aniline colors, is not due to the tariff.

THE WITNESS. A specific duty in one sense would be an unjust one because of the fact that the colors are valued at different prices. A low ad valorem duty of 20 to 25 per cent, it seems to me, would answer every purpose and protect the American manufacturer. As it is now the profits all go into the pockets of these few manufacturers. A reduction of the duty would reduce the price to the consumer, and enable him to produce the better article which is made abroad. I suppose there are some things that we cannot make in this country, which we shall have to let other people in other countries make for us.

BUFFALO, N. Y., August 30, 1882.

VOL. I—PP. 749-750. Mr. J. F. SCHOELLKOPF, JR., of Buffalo, manufacturer of aniline dyes, addresses the commission as follows:

GENTLEMEN: In addition to my communication of July 27, 1882, I desire to call your attention to the following circumstances: Coal tar is procured from bituminous coal; benzole, the raw material for aniline oil, is gained from coal tar by distillation. Now, benzole pays a duty of 40 cents per gallon, whereas aniline oil comes in free. These facts certainly must have been misrepresented at the time the present tariff was framed, for it is evident that if the raw material, benzole, is protected, the manufactured article, aniline oil, is justly entitled to the same privilege. Aniline oil, which is used directly for printing black (on cotton), cannot be manufactured as cheaply here as in Europe, owing to higher labor and high prices for acids (sulfuric and nitric acids) used in its manufacture.

I have learned that New York and Boston parties are circulating a petition among the larger consumers of aniline dyes, with the intention of reducing the duty on such dyes to 25 per cent ad valorem only. This would leave domestic manufacturers virtually without protection. We must have an *absolute* protection, and this can be realized only by a specific duty. I would suggest the raising of the specific duty 25 or 50 cents per pound and dropping the ad valorem duty altogether. This would enable home manufacturers to compete with foreign producers.

By Commissioner AMBLER:

Q. Would not that operate inequitably by reason of the fact that there is a great difference in these dyes? Some of them, I understand, are cheap and others are expensive.

A. Yes, sir.

Q. How do they range in price?

A. From $1 to $5 per pound; the principal colors.

Q. I would suggest that a specific duty per pound, to afford any protection at all on the $5 article, would be too much on the cheaper article.

A. But as I mentioned in my former communication, if we have protection, the domestic competition will reduce the price to a proper level. There are only five manufacturers of aniline dyes in the United States at the present time.

Q. Is it not a fact that any rate that operated as a protection on the $5 article would amount to a prohibition on the article that costs $1?

A. It does not seem so, for they are still importing fuchsine, which is a color worth from $2 to $2.50 a pound.

Q. Did you mention any specific amount of duty per pound which you think would be proper?

A. Yes, sir; the rate of duty now is 50 cents a pound, and 35 per cent ad valorem, and I suggest dropping the ad valorem rate and raising the specific rate 25 or 50 cents per pound.

Q. You mean, raise it 25 or 50 cents above the present duty of 50 cents?

A. Yes, sir.

Q. That would amount to a duty of 100 per cent on $1 dyes, and a duty of 20 per cent on $5 dyes?

A. Yes, sir; but, as I mentionel in my former communication, under these ad valorem duties imported dyes are liable to be undervalued.

Q. Are they generally undervalued?

A. I do not know, but I think they are because it cannot very well be detected. I suggest this high duty in order to give the home manufacturers a start. After five or ten years it would not matter if the duty were taken off; but we must have a large protection to enable us to start. When I was in Europe this spring I was told that if the duty was not taken off in this country the manufacturers there would start establishments in this country, so that we would have plenty of competition.

By the PRESIDENT:

Q. Will you please repeat that statement; do you say that the foreign manufacturers themselves would begin the manufacture in this country?

A. Yes, sir. The president of the largest manufactory in Europe, the Badische Aniline Factory, at Mannheim, told me personally that if the duty was not taken off they would be obliged to start factories over here. I think that shows that the price today in this country is as cheap as it can be.

Q. How many dyes does that establishment now make?

A. They make almost all the known colors. Dyes can be made here, in time, as cheaply as in Europe; but we must have a chance to start the business.

NEW YORK, October 7, 1882.

VOL. I—PP. 1960-1962. The following communication from Mr. A. KLIPSTEIN, of New York, in regard to the duties on dyestuffs and chemicals, was ordered to be printed:

I would recommend putting upon the free list every dyestuff and chemical used in dyeing, calico printing, etc., and every chemical used in making paper, soap, and glass, in bleaching and other industries. These articles may be fairly classed as raw materials for the use of these industries. If these various industries could get their dyestuffs and chemicals free, the saving to them would be so considerable that they would be upon a much better footing for competing with the foreign manufacturers, and it would lead to a large increase of the export trade in their products.

* * * * *

Aniline dyes and colors should be made free. They pay now the enormous duty of 35 per cent ad valorem and 50 cents per pound. At the time the tariff was framed these colors were comparatively little known, and their importance not recognized. Their price was at that time very high, and the 50 cents per pound specific duty was not felt so much. Since then great progress has been made in the manufacture of these dyes, the prices have been very considerably reduced, and large quantities are used.

The difference in duty which our print works, woolen mills, dyers, etc., have to pay is in many instances very considerable, many mills using large quantities, and the saving would amount to each of them to many thousand dollars per year.

The duty on the lower-priced colors, in consequence of the 50 cents per pound specific duty, amounts to 130 per cent. Notwithstanding this enormous duty, there is only a very small quantity (comparatively) of aniline colors made in this country, and the industry has made no progress here in twenty years. This is owing to many circumstances.

What is made at Albany, N. Y., and at some other small factories in the United States, is only the first stage, *viz.*, fuchsine (red). The higher class of colors are not produced, and it is not likely that they will be made of good enough quality.

It is not just that large industries (like the cotton, woolen, silk, calico printing, etc.) should be taxed heavily to support these small factories.

Other dyestuffs and chemicals are used in dyeing, calico printing, etc.—some of these are already on the free list, while others are taxed for no apparent reason. It does not appear, for instance, reasonable that such articles as archil and extract of archil, cudbear or extract of cudbear should be free of duty while the following articles are taxed; for if a high enough duty was imposed on the above, no doubt they would also be made here. * * *
* * * *

Through these tariff restrictions our manufacturers of textiles, etc., are prevented from using to advantage many articles like carmines, lakes, and other special preparations for calico printing, etc., which their competitors in Europe can employ.

Madder lake is taxed 25 per cent, but on the other hand extract of madder is free; naphthalene yellow and naphthalene brown pay 35 per cent and 50 cents per pound, as aniline colors, under the similitude clause, although they are not aniline colors, not any more than other products now assimilated to aniline colors and paying the same duty.

If every article used in dyeing and calico printing were put on the free list, this would do away at once with the many vexatious difficulties resulting in appeals to the Secretary and in lawsuits, which are caused by the present complicated state of the tariff.

PHILADELPHIA, PA., October 16, 1882.

The following report of Mr. GEO. C. TICHENOR, special agent of the Treasury Department, addressed to the Secretary of the Treasury, in regard to importations of foreign goods, having been referred to the commission for its information, was ordered to be printed:

VOL. I—PP. 2486-2488. PAINTS AND DYES—ANILINE DYES AND COLORS (1350 Heyl).—Like the preceding provision, concerning "statuary," this one has provoked much discussion and controversy; has been variously construed by customs officers; has resulted in lawsuits, and has caused the department a vast amount of trouble and vexation. The tariff act of June 30, 1864, provided that "aniline dyes" should pay duty at $1 per pound and 35 per cent ad valorem. At the period of the passage of this act the industry devoted to the production of these dyes was in its infancy and had scarcely developed beyond an experimental state. The products were then derived exclusively, I believe, from a single hydrocarbon resulting from the distillation of coal tar, then exceedingly expensive, and which was called aniline—a mere arbitrary and accidental name, which owes its origin to the circumstance that its coloring principle was, I believe, first discovered by a Portuguese chemist, through the destructive distillation of indigo, which is known as "anil" in the language of Portugal. At that time (1864) these so-called aniline dyes were enormously expensive, had not entered into general use in the arts of dyeing and printing, and it was not thought that the high rate of duty would burthen our textile industries or be at all generally felt. It was also, probably, the intention to encourage and foster the production of these dyes in this country. It should also be borne in mind that we were then in the midst of the war period, and were legislating to increase our revenues. Dyes that were then worth in Europe say $30 per pound are now scarcely worth $3. So that at that time the specific rate of $1 per pound was a comparative trifling matter.

The act of July 14, 1870, fixed the duty on "aniline dyes and colors, by whatever name known," at 50 cents per pound and 35 per cent ad valorem. Although great progress in the industry had been made by this time, and the cost and price of the dyes had been much reduced, they were still of high price, were being produced from the same source, and had not come into general use. Efforts had also begun to be made to build up the industry in this country, and the protective idea was in consequence perpetuated in the new act.

Within the twelve years past far greater progress has been made in this industry in Europe than in all previous time. In addition to reducing the cost of production and selling price of the original aniline dyes proper to a fabulous extent, and thereby vastly extending their use, a vast field of new and useful dyes have been produced from naphthalene and other coal tar derivatives, which, coming from a cheaper source than aniline, have been produced at still diminished cost, and have come into quite general use as substitutes for many of the old vegetable and other organic dyes, including cochineal, logwood, and indigo, while madder has been almost entirely supplanted by a dye called alizarine, produced from anthracine; this latter dye having been originally classified as a manufactured article not otherwise provided for at 20 per cent ad valorem, the other newly-discovered dyes, produced from other coal tar derivatives than aniline, were entered and largely passed under the same classification as alizarine, which also led to entering many colors mainly produced from aniline at the same rate of duty, while others again were entered and passed as paints, etc. The department's attention having been brought quite fully to the subject, it was held in numerous decisions that dyes or colors produced from derivatives of coal tar other than aniline were subject to duty as "aniline dyes and colors," in accordance with the provisions of Section 2499, Revised Statutes, from which decisions and assessment of duties numerous appeals have been taken, and some suits brought for the recovery of duties in excess of 20 per cent.

Alizarine, so-called, was taken out of the controversy by the act of February 8, 1875, by being placed on the "free list" with "madder and munjeet," which it had largely superseded. All these coal tar dyes are familiarly—commercially—known as aniline dyes, or aniline colors, and I can see no reason for putting alizarine on the free list that would not apply both to its older and younger associates, a number of which pay duty in excess of their actual cost in the country of production. I think no candid man who understands the subject will contend for a moment but that all of these dyes, "by whatever name known," coming from any of the series of coal tar hydrocarbons, should be subject to the same rate of duty so long as they remain dutiable; they all come from the same parent source, take the same place substantially in the arts, and are used for the same purposes; those being for coloring silks, woolens, cottons, jute, flax, leather, and other substances, as well as for the manufacture of different colored writing and printing inks, artists' and painters' colors, etc., in which manufactures they are in the nature of raw materials. It requires expert knowledge of the very highest order, aided by most exhaustive chemical analysis, to determine whether one of these dyestuffs, as imported, comes from aniline, naphthalene, or some coal tar product; so that they should all be included under one and the same head in the tariff. I incline to think a provision in substance as follows would meet the case, *viz.:* "All paints, dyes and colors, produced in whole or in part from coal tar or its derivatives." This, it will be seen, would include some articles, notably alizarine and picric acid, now on the free list, and hence would admit of a large reduction in the rate of duty without decreasing the aggregate amount of duty derived from dyestuffs. And since all these dyestuffs enter into the same uses as the large number of organic dyes and coloring matters now on the free list there is apparently no good reason why the latter should not, as well as the former, pay duty.

The experience of the last eighteen years has, I regret to say, shown that a high protective duty has not resulted in the building up of anything worthy of the name of an aniline color industry in this country, notwithstanding it is understood that there is an abundance of the raw materials here, and aniline oil and arseniate of aniline have been admitted free of duty. There are, to be sure, a few small concerns making certain classes of colors, but these employ so few people and produce such limited quantities of dyes as hardly to amount to an industry worth protecting at the expense, at least, of burthening and crippling the vast industries devoted to the manufacture of textile fabrics, as well as to putting a tax upon the consumers of such fabrics.

Having, after much inquiry and experience, ascertained beyond question that aniline dyes imported into the country have been largely undervalued, and that it is practically impossible to prevent such undervaluation so long as they are subject to an ad valorem duty high enough to present any inducement of consequence for undervaluing, I am convinced that it would be advisable to retain the specific feature with an ad valorem rate sufficient only to serve as an equalizer, and not to exceed 15 per cent. I have thought that 25 cents per pound and 15 per cent ad valorem would be as high a rate as could be asked for purposes of protection. This would amount to near 40 per cent on a very liberal proportion of the dyes most used, and to about 60 per cent upon some of them.

I was informed while in Europe that the use of arsenic in the manufacture of all coal tar dyes had been prohibited by the German government, and perhaps by others, not only on account of the danger to the life and health of those engaged in their production, but also to those who wear garments and live in rooms where the carpets, curtains, and papered walls have been dyed or printed with such arsenic colors.

REVISION OF THE TARIFF
HEARINGS BEFORE THE COMMITTEE ON WAYS AND MEANS, 1889-90

NEW YORK, December 10, 1888.

PP. 393-398. *The Subcommittee on the Tariff of the Senate Committee on Finance:*

The undersigned manufacturers of coal tar dyes beg leave to present the following statement with regard to the tariff bill now under discussion:

The great difference in the cost of raw material, both imported and domestic, and the still greater difference in the price of labor between here and Europe, makes it impossible for the home manufacturers to successfully compete with those of Europe, even if the duty of 35 per cent be actually paid.

Annexed schedule will show clearly the disadvantages under which we labor.

We also submit a statement of one of the largest factories in Europe showing their consumption of raw materials and products for one year, thus illustrating the importance of this industry for the United States, if fully developed by a protective policy.

In order to give the domestic manufacturer a safer protection, to enforce a strictly honest entry of values, and to insure the importation of the best quality of goods only, we suggest that a specific, or at least a partly specific duty be imposed.

To overcome the apparent difficulty of equalizing the duty on the various priced goods more justly, we propose to separate coal tar dyes into two classes, which can easily be distinguished, and which would also separate the high-priced colors from the cheaper ones, *viz.:*

COAL TAR DYES AND ACIDS OR BASES OF COAL TAR DYES

Class I—Azo colors, picric acid, and naphthol yellow, 25 per cent ad valorem and 10 cents per pound gross weight.

Class II—Non-azo colors, 25 per cent ad valorem and 25 cents per pound gross weight.

Our authority for this classification is the list of coal tar dyes as compiled by Gustave Schultz and Paul Julius, and published by R. Gaertner, at Berlin, in the year 1888.

This book not only gives the scientific and trade names, but also a description of the outward appearance of all coal tar colors and their action when treated with certain named re-agents, thus clearly establishing the identity of the respective dyes.

Very respectfully,
Albany Aniline Company.
Schoellkopf Aniline and Chemical Company.
Heller & Merz.
Hudson River Aniline Color Works.

We also beg to call your attention to the following: Under "paragraph 974" aniline oil is free. We would suggest to strike out the words "aniline oil" and insert the words "commercial aniline oils." All aniline oils are mixtures of several products, but the law as it now stands is liable to be misconstrued by the custom-house officials.

SCHEDULE SHOWING THE CONSUMPTION OF RAW MATERIAL AND PRODUCTS FOR THE YEAR 1887-'88, BY FARBWERKE, VORM. "MEISTER, LUCIUS AND BRUENING," AT HOECHST-ON-THE-MAIN

	Long tons		Long tons
Coal	64,230	Pyrites	12,661
Coal-tar products	3,624	Iron borings	1,503
Caustic soda	2,112	Methylated and ethylated spirits	309
Different potash salts	350	Various chemical products	1,635
Soda	1,610	Rock salt	10,518
Nitrate of soda	1,905	Lime	4,312

Should this factory be located in the United States 93 per cent of the above material would have to be produced in our country, 2 per cent nitrate of soda would come from South America, and of the remaining 5 per cent, consisting of "coal tar" and various chemical products, a large part, if not the whole, would be manufactured in America.

To ship the manufactured products of above factory the following packages were used:

Casks	25,310	Bottles	803,200
Tins	1,962,000	Cases	25,310

The effect on the carrying of such an establishment can well be imagined.

This house was founded in 1863, and commenced operations with one 3 horse-power steam engine and 7 employees, which have been increased in the comparatively short time of twenty-five years to 1,840 horse-power and 2,062 employees.

SCHEDULE SHOWING EFFECT OF THE PROPOSED CHANGE OF DUTY ON THE PRICE OF THE MOST IMPORTANT COLORS NOW ON THE MARKET

Class I—Azo colors, etc.	Cost in Europe Cents	35% Cents	25% and 10c. per lb. Cents
Orange Y	22	29.7	37.5
Orange R	25	33.75	41.25
Orange No. 4	60	81.5	85
Metanil yellow	75	101.25	103.75
Chrysoidine	40	54	60
Bismarck brown	72	97.2	100
Scarlet 2 R	27	36.35	43.25
Scarlet 3 R	34.5	46.57	52.1
Fast red	22	29.7	37.5
Crocein scarlet	47	63.5	68.75
Benzo-purpurine 4 B	100	135	135
Chrysamine R	100	135	135
Hessian purple	100	135	135
Hessian yellow	100	135	135
	824.5	1113.52	1169.10

Cost in Europe, 100 per cent.
Present duty cost in United States, 135 per cent.
Proposed duty cost in United States, 142 per cent.

Class II—Non-azo colors.	Cost in Europe	35%	25% and 25c. per lb.
Auramine	$ 2.00	$ 2.70	$ 2.75
Victoria green	0.72	0.972	1.15
Acid green	1.00	1.35	1.50
Victoria blue	1.40	1.89	2.00
Fuchsine	0.84	1.13	1.30
Violet crystals	1.67	2.25	2.34
Violet 3 B	0.80	1.08	1.25
Cotton blue 5 B	2.90	3.91	3.875
Cotton blue B	1.50	2.02	2.125
Methylene blue	2.11	2.85	2.89
Eosine	1.25	1.635	1.81
Erythrosine	3.00	4.05	4.00
Rhodamine	5.00	6.75	6.50
	24.19	32.637	33.49

Cost in Europe, 100 per cent.
Present duty cost in United States, 135 per cent.
Proposed duty cost in United States, 138.4 per cent.
(142 + 138.4) ÷ 2 = 140.2.
140.2 — 135.0 = 5.2.
∴ Average higher duty under proposed duty = 5.2 per cent.

VIEWS OF FRED. KOEHLER

Washington, D. C., December 13, 1888.

The Subcommittee on the Tariff of the Senate Committee on Finance:

Mr. Pickhardt, in his statement regarding the manufacture of aniline colors in this country, having alluded to myself to sustain his assertion of the impossibility to make said dyes here, I beg leave to submit the following:

I was employed as chemist in the largest aniline color factory in Germany and in the world from 1874 to 1883, and as such have had in my hands and am familiar with the manufacture of all aniline colors known up to that date. I subsequently was engaged for over five years in the aniline color manufactory in this country, and I therefore believe myself more competent to judge about the possibility or impossibility of making colors here than Mr. Pickhardt. This gentleman having never been a manufacturer of coal tar dyes himself, can only express the views of his friends in Germany about this matter or possibly the views they wish to impress upon your committee. If they really are convinced that aniline colors never can be profitably produced here, why are they not willing to let the American manufacturers die a natural death instead of trying to kill them quickly by having the duty removed, trying it even to the point of raising money among the German aniline color manufacturers for that purpose? I, for my part, am firmly convinced that aniline colors can and will be made here, and, as a matter of fact, about 20 per cent of the home consumption are actually made here.

I am further convinced that had the duty not been lowered in 1883 not one pound of aniline color would be imported today.

It is true we did not succeed nearly as well as I expected, but that does not prove the impossibility to succeed finally. In the light of my knowledge of the circumstances under which this industry exists here and abroad, I find the reasons for its slow progress here chiefly as follows:

(1) In the very large difference in wages. An ordinary laborer in German aniline factories reecives at the utmost 58 cents for eleven hours' work, while we must pay from $1.25 to $1.75 for ten hours.

(2) In the large difference in the cost of raw material.

(3) In the difficulty we have in selling our goods. There are now about twenty agents of foreign manufacturers established in this country, who until recently have had practically the whole market, and whom we must undersell materially in order to procure any share of the market.

In conclusion, I would reiterate my statement that it is my firm belief that coal tar colors can be made here, and it rests wholly with your honorable body to make the industry prosper or die out by tariff legislation.

Respectfully,

FREDERICK KOEHLER.

REMARKS ON MR. WILLIAM PICKHARDT'S TESTIMONY GIVEN BEFORE THE SUBCOMMITTEE ON THE TARIFF OF THE SENATE COMMITTEE ON FINANCE, DECEMBER 5 AND 6, 1888

Mr. Pickhardt does not contradict our statement that he charged $1 per pound over the European price. We are informed by the defendants in the suit that the patent had two years longer to run when the adverse court decision came, and other alizarine importers stated that Mr. Pickhardt could have had the patent two years longer if he had permitted the defendants and one or two others to share in the profits.

Page 8, *b, line* 8—Anthracene was formerly made here and could be made here again.

Line 16—The coal tar produced here is practically the same as that produced in London.

Page 9, *b, line* 9—Considerable coal tar products are made in this country and used for coal tar dyes and other purposes in spite of Mr. Pickhardt's decisive "No."

Page 12, *line* 15—How can the woolen mills of Rhode Island be retarded when the duty on the whole importation of coal tar dyes used for cotton, wool, silk, paper, jute, lake colors, etc., only amounts to $400,000 per year? On all these articles the quantity of color used can not average 1 pound of dye to 100 pounds of material.

Page 13, *line* 8—If Mr. Pickhardt calls the stuff the New York Coal Tar Company distills benzine, he tries to mislead. He must know this is commercial benzole—50 and 90 per cent used in the manufacture of coal tar products. In fact, these are the standard grades produced by coal tar distillers for the trade.

Line 13—On a previous page Mr. Pickhardt describes the process of distillation very minutely, and here he does not know what comes off first.

Page 14, *line* 17—Mr. Pickhardt says that his factory was only making 10 per cent on their capital. For the last four years they declared dividends of from 12½ to 25 per cent after deducting large amounts for wear and tear, reserves, etc. His statement that an aniline factory would be useless for any other purpose is absolutely true. Mr. Pickhardt's statement that all azo dyes are made from naphthole and naphthalene and the aniline colors from aniline is incorrect and shows how very little he understands of the real nature of coal tar dyes. The very first azo color discovered—amidoazo benzole—is a pure aniline color and contains not a trace of naphthole or naphthalene. The true characteristic of an azo dye is the fact that it contains the azo group N-N.

Page 15, *line* 10—If the patent has nothing to do with the price it is singular that alizarine red should have dropped $1 per pound as soon as the patent was practically declared void, page 7.

Page 19, *line* 9—Mr. Pickhardt's assertion that transportation from London to New York is as low as from London to Germany is not correct. It costs three times as much to New York as to Cologne on the Rhine.

Page 21, *line* 20—It is singular that Mr. Pickhardt can not state the difference in price of soluble and insoluble alizarine blue, as he imports and sells both. We protest against putting the alizarine colors on the free list. These colors, with free alizarine red, can be produced here as well as any of the coal tar colors.

Page 5, *c, last line*—The Buffalo people never tried to sell their factory to Mr. Pickhardt or anybody else. The reason why the industry did not develop is because the duty was lowered in 1883 but not because we can not get the proper help.

Page 7, *c*—The reasons for the decline in prices of aniline colors are, first, cheaper raw material; second, improved methods and principally on account of the enormously increased output. Farbwerke, Meister, L. and M. produced in 1863, 10 to 14 pounds of magenta per day; in 1873 they produced 770 pounds per day.

Mr. Pickhardt's reply to Mr. Randall's letter—In 1883 Heller & Merz's ultramarine factory was about the third largest in the world and probably furnished 10 per cent of the world's consumption. The labor in aniline factories in the United States ranges from $1.25 to $1.75 per day for ordinary laborers.

We estimate the production of aniline dyes in the United States at 500,000 pounds, and the value at $500,000.

Mr. Pickhardt's statement regarding the number of men employed in this industry is probably correct. In this connection we may say that the Buffalo factory employed over 100 men before the last reduction in duty. They now employ about one-half that number.

The production of aniline colors in Germany last year was in round numbers 13,000,000 pounds. Of this, one-ninth is exported to the United States. Seven-eighths of the entire output is exported.

The following is a pretty complete list of coal tar dye factories in Europe: Germany, 18 factories; England, 6 factories; France, 6 factories; Switzerland, 6 factories.

It would be very desirable to have free alcohol, but for many purposes it should be free from admixtures such as methyl alcohol, camphor oil, etc.

Page 14—There is a decided difference between dyewood and coal tar colors. The first named are products of agriculture, while the latter are wholly manufactured articles.

Page 18—Mr. Pickhardt says here that in 1872, when he contemplated starting an ultramarine factory, nobody else had thought of it up to that time. He seems to have forgotten that he bought ultramarine from Heller & Merz several years before the date mentioned.

Pages 19 *and* 20—Not everybody seemed to have been of Mr. Pickhardt's opinion regarding the foolishness of starting an aniline factory here. As late as 1882 the general manager of Mr. Pickhardt's factory told Dr. Koehler that he considered America a good field for that industry then and he would come over himself if he had been younger. He told Dr. Koehler he did not consider the Americans crazy enough to lower the duty. Another authority on this subject is G. Schultz, who, in his book on coal tar dyes, edition of 1882, says: "The tar in Russia and especially in America is developing. The latter country may soon be a serious competitor in this line to Europe."

Page 22—Mr. Pickhardt evidently wishes to convey the impression that our raw material is almost finished color. This is not the case by any means, as Mr. Pickhardt knows. With the exception of a few of the very largest, all the European factories buy their material in the same state as we do.

SCHEDULE SHOWING THE PRINCIPAL RAW MATERIALS USED IN AMERICAN COAL-TAR DYE FACTORIES, AND THEIR PRICES HERE AND ABROAD

	Price per pound in	
	Europe	United States
Sulfuric acid 66°	$ 0.45	$ 0.95
Nitric acid 40°	4.75	5.50
Muriatic acid 20°	0.30	1.10
Aniline oil for blue	16.33	18.00
Aniline oil for red	15.00	16.50
Toluidine	15.00	19.50
Nitrobenzole	14.70	18.00
Binitrotoluol	14.70	18.00
Bichromate of soda	7.00	9.50
Salt	0.10	0.25
Naphthole	14.40	18.00
Nitrite soda	5.77	7.72
Alkali, 58 per cent	1.10	1.40
Iron borings	0.50	0.75
Caustic soda, 74 per cent	1.74	2.84
Labor per week	4.04	10.00
Total	$115.88	$148.01

The above list shows that we have to pay for our raw material and labor on an average 28 per cent more than it costs on the other side. If it is further considered that we are obliged to undersell imported dyes from 5 to 10 per cent, that our plant costs at least twice as much, the

One Week's Production of Safranine	Cost in Europe	Cost in U. S.
600 lbs. aniline oil	$90.00	$99.00
150 lbs. nitrite soda	8.64	11.58
2,400 lbs. of muriatic acid	12.00	24.00
600 lbs. iron borings	3.00	4.50
960 lbs. whiting	3.84	5.76
1,110 lbs. bichromate soda	77.70	105.42
30,000 lbs. salt	30.00	75.00
Labor	16.16	40.00
Total	225.18	325.26
Wear and tear	11.26	32.52
	236.44	357.78
Per cent	100	151

One Week's Production of Orange	Cost in Europe	Cost in U. S.
660 lbs. aniline oil	$107.79	$118.80
1,710 lbs. sulfuric acid, 66°	4.29	16.25
345 lbs. alkali, 58 per cent	3.81	4.83
270 lbs. lime	0.54	0.54
396 lbs. nitrite soda	22.86	30.57
720 lbs. naphthole	103.68	132.60
600 lbs. caustic soda	10.44	17.04
2,100 lbs. salt	2.10	5.25
Labor	12.12	30.00
Total	267.63	325.88
Wear and tear[1]	13.38	32.58
	281.01	358.46
Per cent	100	128

One Week's Production of Bismarck Brown	Cost in Europe	Cost in U. S.
900 lbs. binitrotoluol	$132.30	$162.00
1,910 lbs. muriatic acid, 20°	9.55	19.10
702 lbs. alkali, 58 per cent	7.72	9.83
2,400 lbs. iron	12.00	18.00
222 lbs. nitrite soda	12.81	17.14
1,200 lbs. salt	1.20	3.00
Labor	12.12	30.00
Total	187.70	259.07
Wear and tear	9.38	25.90
	197.08	284.97
Per cent	100	145

One Week's Production of Fuchsine	Cost in Europe	Cost in U. S.
4,188 lbs. aniline-oil	$628.20	$691.02
17,400 lbs. salt	17.40	43.50
210 lbs. alkali, 58 per cent	2.31	2.94
2,664 lbs. muriatic acid	13.32	29.30
1,900 lbs. nitrobenzole	190.00	237.50
Labor	40.40	100.00
Total	891.63	1,104.26
Wear and tear[1]	44.58	110.42
	936.21	1,214.68
Per cent	100	130

[1] In Europe 5 per cent; in United States 10 per cent.

Total Per Cent for Four Dyes	400	554
Average Per Cent for Four Dyes	100	139

higher interest on capital and insurance, on plant and wear and tear of same, and the difference in scientific and clerical help, it will be plain to everybody that 35 per cent, even if fully collected, is an entirely inadequate protection. This assertion is borne out by the schedules given above, showing the different costs of a few of the principal colors in this country and abroad.

All of above calculations do not include salaries for chemists and office help, insurance on plant, interest on capital invested, etc., all of which items form a large part of the cost of the finished product, and cost at least twice as much here as they do in Europe.

TARIFF HEARINGS BEFORE THE COMMITTEE ON WAYS AND MEANS, 1896-7

MONDAY, December 28, 1896.

PP. 57-61. Mr. SCHOELLKOPF submitted the following paper:

COMMITTEE ON WAYS AND MEANS, Washington, D. C.:

The undersigned coal tar dye manufacturers of the United States respectfully submit that the following changes be made in the present tariff law:

Paragraph 14, which reads as follows: "Coal tar colors or dyes, by whatever name known, and not specially provided for in this act, 25 per cent ad valorem," should be changed to read as follows:

"Coal tar colors and dyes of every description not specially exempted by name, 35 per cent ad valorem."

The change in phraseology increases the clearness of the paragraph, and the increase in duty to 35 per cent is absolutely necessary to put the industry on a footing which will enable it to compete successfully with the foreign makers.

Article 443: "Coal tar, crude, and all preparations except medicinal coal tar preparations and products of coal tar, not colors or dyes, not specially provided for in this act, free."

This article should be changed to read as follows:

"Coal tar and all products and preparations of coal tar, not colors or dyes, except medicinal coal tar preparations and such other coal tar products and preparations which are specially exempted by name, free."

This phraseology makes the paragraph much clearer without, in any way, changing its meaning, and will avoid differences of opinion as to where certain products belong.

Article 368, which reads as follows: "Alizarine, natural and artificial, and all alizarine colors and dyes, free," should be changed to read as follows: "Alizarine, natural and artificial, free."

This is the way the paragraph stood in the act of 1883, and there is no reason whatever why alizarine colors, which are nothing more nor less than coal tar colors, should be put on the free list any more than any other class of coal tar colors.

The tariff of 1890 left the domestic coal tar dye manufacturers in a very unfortunate position, with the duty of 35 per cent on the colors and 20 per cent on coal tar preparations, which constitute a large percentage of the raw material for the colors. This, in addition to the higher prices we are compelled to pay for labor and other domestic chemicals, precluded any real progress of the American manufacturers in their struggle against the aggressive competition of the well-equipped German factories. The Wilson bill placed the coal tar preparations on the free list, but by reducing the duty on the colors to 25 per cent did not improve the position of the domestic makers. We feel confident that the slight increase asked for, which makes the rate what it was under the tariff act of 1883 and 1890, will enable us, with the experience we have gained under adverse circumstances and with the great domestic progress in scientific chemistry, to successfully compete against the imported goods and in time supply the home market.

THE HELLER & MERZ CO.,
Henry Merz, *Treasurer.*

THE SCHOELLKOPF ANILINE AND CHEMICAL CO.,
By J. F. Schoellkopf, Jr.

HUDSON RIVER ANILINE COLOR WORKS,
Louis S. Waldman, *President.*

THE CHAIRMAN. What is the extent of this industry of coal-tar colors in this country?

Mr. SCHOELLKOPF. There are three plants with an aggregate capital of about a million dollars.

The CHAIRMAN. And how many employees?

Mr. SCHOELLKOPF. About 150 direct. Of course, the coal-tar dye industry is very large, in fact the largest consumer of crude chemicals, such as acids, etc., and in that way gives employment to a large number of hands indirectly.

The CHAIRMAN. About what proportion of the consumption of this country is produced here now?

Mr. SCHOELLKOPF. I would say about 20 to 25 per cent.

The CHAIRMAN. I see that the imports last year amounted to about $3,000,000.

Mr. SCHOELLKOPF. Well, I think that includes the alizarine red, also, as well.

The CHAIRMAN. It includes all dutiable coal-tar colors?

Mr. SCHOELLKOPF. Yes; I think that alizarine colors, which are coal-tar colors, of course, are included in that.

The CHAIRMAN. I presume so.

Mr. SCHOELLKOPF. I would like to mention that in this percentage I was not referring to alizarine red, which is on the free list now and always has been on the free list.

The CHAIRMAN. Are alizarine colors made in this country?

Mr. SCHOELLKOPF. They are not at present. They are on the free list at present and, of course, can not be made here. They could be made.

The CHAIRMAN. No attempt has been made to make them?

Mr. SCHOELLKOPF. They could be made.

The CHAIRMAN. Are there any special difficulties in the manufacture of these colors in this country?

Mr. SCHOELLKOPF. There are not now.

The CHAIRMAN. Growing out of the technical education which is required?

Mr. SCHOELLKOPF. That used to be the case formerly, but, of course, as I have stated in my paper, we have overcome these difficulties and are in a fair shape to capture the home market if we are sufficiently protected; and aside from the coal-tar products, which are on the free list, we consume vast quantities of other chemicals which are made in this country and can not be imported, such as acids, etc.

The CHAIRMAN. There is a great difference in the value of these materials?

Mr. SCHOELLKOPF. Yes, sir.

The CHAIRMAN. Therefore an ad valorem duty, perhaps, could be applied better than a specific duty could be applied?

Mr. SCHOELLKOPF. It would be rather difficult to apply a specific duty.

The CHAIRMAN. The prices ranging from what to what?

Mr. SCHOELLKOPF. Running from 20 to 25 cents a pound up to $15 a pound.

Mr. MCMILLIN. What will be the value of the product which will be affected by the change of from 25 per cent ad valorem to 35 per cent?

Mr. SCHOELLKOPF. You mean the value at present of the products of this country?

Mr. MCMILLIN. Yes, sir.

Mr. SCHOELLKOPF. I should say about $600,000 or $700,000.

Mr. MCMILLIN. And the present duty being 25 per cent, 10 per cent added to that is an increase of more than 20 per cent of the present rate. That would be a difference of between $100,000 and $200,000 added to the value of that product?

Mr. SCHOELLKOPF. I doubt very much whether it would add that much to the direct cost at the present time. We are not really able to compete at all, and while we are selling our colors we are not making anything on them, and we can not possibly make anything on them, and it is not so much we ask an increased duty to increase our prices greatly but simply to be better able to compete. It is not so much we want to increase the prices one or two hundred thousand dollars, but if we can increase our production we can produce cheaper if we are sure of this market, but if we must compete against twenty-five or thirty importers in New York, each one of whom represents a large manufacturing establishment on the other side, we must compete on even their terms and we must expect to get our proportion of the business which will be about 5 or 10 per cent, because this is our only market, and we can not manufacture on a sufficiently large scale to produce cheaply.

Mr. McMillin. How many hands does your concern employ?

Mr. Schoellkopf. We employ at the present between 60 and 70 hands.

Mr. McMillin. And there are three concerns, representing the business of this country, I believe you stated, who employ about 150 hands?

Mr. Schoellkopf. Some gentleman here can state that better than I can.

The Chairman. From what source of supply is crude tar product obtained—the residuum of the manufacture of gas?

Mr. Schoellkopf. Yes, sir.

The Chairman. It comes from no other source in commercial quantities. Is is a by-product of the manufacture of gas?

Mr. Schoellkopf. Yes, sir.

The Chairman. Has the supply of coal tar of this country been diminished by the extensive manufacture of water gas instead of coal gas?

Mr. Schoellkopf. It has.

The Chairman. Is the supply insufficient in this country?

Mr. Schoellkopf. The raw materials we use are an intermediate product between coal tar and coal-tar colors. There are certain products of coal tar which are intermediate, and those are the products which we use.

Mr. McMillin. Is any considerable portion of this raw material imported?

Mr. Schoellkopf. A very considerable proportion.

Mr. McMillin. But you get your raw material free?

Mr. Schoellkopf. Yes, sir.

Mr. McMillin. You do not seek to add a duty to that?

Mr. Schoellkopf. No, sir; we do not. In fact, we could not.

The Chairman. The reason is there is an insufficient supply of the by-product?

Mr. Schoellkopf. That is one reason. Of course, we could not get along without a duty on colors. We would have to have an additional duty on colors if we put an additional duty on the raw material.

ANILINE COLORS AND DYESTUFFS

Statement of F. E. Atteaux & Co., of Boston, Mass.

Boston, Mass., January 9, 1897.

Committee on Ways and Means:

We beg leave to present in brief our reasons for requesting that a duty be placed upon all colors commercially known as alizarine colors, with the exception of true chemical alizarine.

We are domestic manufacturers of so-called alizarine colors and dyestuffs, and have our works at South Boston, Mass. Our plant there is valued at about $75,000. We have been in this business a number of years, and are manufacturing a line of colors which come into competition with the so-called alizarine colors which are imported to this country. In the last ten years we have spent over $20,000 experimenting, and we are now able to make a considerable number of colors which do the work of the imported colors. We feel that we are entitled to consideration and that our interests ought to be considered by your committee in framing this bill.

BENEFITS THE DOMESTIC CONSUMER

In 1890, when we commenced to manufacture the color which we call alizarine violet, and which took the place of the foreign alizarine violet, the imported color was sold in this market at 75 cents a pound. Today it is being sold at 28 cents a pound, and the reduction has been largely due to our competition. We make in the same way alizarine green, so called, and this comes in competition with the imported veridine, or coeruline. The importers were selling this color at that time at about 48 cents a pound. Today, largely in consequence of our being able to manufacture a similar color, the price has fallen to 25 cents a pound. These are only two instances of cases which may be amplified to show your committee what has been the effect of our presence as manufacturers in this market. In addition to these two colors we are now manufacturing five other so-called alizarine colors, to wit, Blue B., Blue G. S., Blue R., Brown O., and Brown R. These colors come into competition with and take the place of imported alizarine blue and brown. The foreign colors are patented, as is well known, and the prices charged here and abroad for the same article have greatly varied, at the expense of the American consumer.

It is well known to the coal-tar color trade that prior to 1888 a certain firm of importers in this country was charging $1.25 per pound for alizarine which was sold all over Europe at 25 cents. As long as we are not able to produce these colors, the complete control of the market will enable the foreigner to charge a price without reference to the cost, and based entirely upon the needs of the consumer and his inability to obtain the color from any other source. In this connection, we beg leave to refer your committee to the statements made and testimony taken July 7, 1888, before the subcommittee on the tariff of the Senate Committee on Finance, and printed on page 268.

The fact that the imported colors are patented does not make it impossible for us, under equal conditions, to compete with these articles, as we have been able in the past and expect in the future to make colors which will do the work of the imported colors and not infringe upon their patent rights. If we can do this, it will be seen that it will be of large benefit to the domestic consumer, as the patent has been in the past the means of keeping up the prices artificially in this country. As soon as we have been able to make a color that did the work of a foreign color we have found that the importers have been compelled to bring their prices down and to sell at or below our price; and this price of ours being based upon the cost of manufacture has given the consumer the benefit of a large reduction in the artificially sustained price.

DUTY ON RAW MATERIAL AND NOT ON THE MANUFACTURED ARTICLE

In our industry we are confronted with conditions imposed by the tariff which are a reversal of the usual methods of protection. We are paying 25 per cent duty on the articles which we import and use as the material for making our colors. We are compelled to sell the colors which we manufacture in competition with the so-called alizarine colors which are entered without duty by the importers. We use at present as our raw material imperial blue, chrome orange, and naphthol yellow, and on these we pay at the custom-house 25 per cent duty as coal-tar colors.

In addition to this, it may be stated that our labor costs at least double that of Europe, we paying $1.50 a day while the same class of labor can be had there at 75 cents a day. As we have heretofore stated, this is a direct reversal of the theory of protection of a new industry, and we feel that if we are compelled to pay a duty of 25 per cent for that which enters into our complete product, the article which is not manufactured and with which we are now competing should pay at least the same rate of duty * * *.

TARIFF HEARINGS BEFORE THE COMMITTEE ON WAYS AND MEANS, 1908-1909

WEDNESDAY, November 11, 1908.

VOL. I—PP. 128-130. Mr. SCHOELLKOPF. I represent the Schoellkopf, Hartford, Hanna Company, of Buffalo, N. Y., and the Heller & Merz Company, of Newark, N. J. I have prepared a short brief, which I will read.

(Reads:)

BUFFALO, N. Y., November 9, 1908.

Hon. SERENO E. PAYNE,
Chairman Ways and Means Committee.

DEAR SIR: The undersigned respectfully request that at the impending revision of the tariff the minimum duty on coal-tar colors and dyes be increased from 30 per cent to

40 per cent ad valorem, and that all coal-tar products and preparations not colors or dyes used in the manufacture of these dyes be placed on the free list.

In submitting this request we do so with the understanding that it is the intention of Congress so to adjust import duties as to give the domestic manufacturer adequate protection against his foreign rival; or, in other words, the duties imposed shall cover the difference in cost of the article protected when made in America as against the same article when made abroad.

In asking for free entry of all coal-tar products and preparations used in the manufacture of coal-tar colors, no American industry will be injured, as these articles are not made in the United States, nor can they be manufactured profitably under existing conditions.

In order to prove that our demands, as outlined above, are not unreasonable we have prepared the following tables:

Table A—Showing cost of coal-tar dye plant in America and Germany, designed for a yearly output of 3,000,000 pounds; also showing the cost for depreciation on buildings and wear and tear on machinery and interest on investment.

Table B—Showing number of employees required and their salaries for such a plant in America and Germany.

Table C—Showing material required to produce 3,000,000 pounds of color and cost of same under present tariff; also under tariff as proposed by us; also cost of same material in Germany.

Table D—Showing comparative cost of 3,000,000 pounds of color when produced in Germany; also cost when produced under present tariff; also cost when produced under tariff as proposed by us.

By referring to Table D it appears that taking the cost of colors in Germany at 100 per cent, the same colors cost to produce in America under the present tariff 144.1 per cent, and in case all coal-tar preparations should be admitted free, the cost would still be over 134.4 per cent. That our figures are correct is positively proven by two highly significant facts.

First. These same colors are now being imported from Germany and sold in this market for less than it costs us to produce them, even omitting charges for depreciation and interest on investment.

Second. By the fact that German manufacturers do not manufacture in the United States because, as people high in authority state openly, they can manufacture the colors in Germany and lay them down in the United States, with duty of 30 per cent and manufacturer's profit added, at a lower price than they could manufacture the same colors in America.

By referring again to the same table it appears that under the proposed tariff the cost of colors would be only 35 per cent higher than the same colors when made in Germany, while we are asking for a duty of 40 per cent. It should be borne in mind, however, that in the first place the American manufacturer, in order to secure the home market, must be in a position to under-sell the importer, and in the second place, the foreign manufacturer, when driven to it, will always assume part of the duty himself. The result would be that with a duty of 40 per cent the American manufacturer could not hope to realize more than 30 per cent in excess of what the same goods are sold for in Germany, and probably considerably less. In any event, therefore, even with a 40 per cent duty, the American manufacturer would have to content himself with a considerably smaller profit than his German rival.

Since the present tariff went into effect American coal-tar dye manufacturers have striven strenuously to capture the home market, and while they have succeeded in increasing very materially their output, they have done so at no profit to themselves. Whenever the domestic production of any one color increased sufficiently to interfere seriously with the sale of the imported product, the foreign manufacturers dropped prices to a point that compelled the American manufacturer to sell at cost or even lower.

On the other hand, colors not made in America and controlled by the foreign manufacturers, either through patents or combinations, were not only not reduced, but in many instances actually increased in price. Eliminate American competition, and prices, even with a reduced duty, will rise and not fall. We refer to such products as alizarines, aniline salt, aniline oil, beta napthol, etc., which during the past few years have been advanced from 15 to 20 per cent, although the cost of production has not risen.

TABLE A—SHOWING COST OF COAL-TAR DYE PLANT DESIGNED FOR A YEARLY OUTPUT OF 3,000,000 POUNDS; ALSO SHOWING THE COST OF DEPRECIATION OF BUILDINGS AND WEAR AND TEAR ON MACHINERY, ETC.

Cost of plant in	U. S.	Germany
For land	$50,000	$50,000
For buildings	100,000	60,000
For machinery, tools, etc	380,000	250,000
For working capital	500,000	350,000
Total cost of plant	1,030,000	710,000
Depreciation on buildings, 5 per cent	5,000	3,000
Wear and tear on machinery, etc., 10 per cent	38,000	25,000
Interest on investment, 6 per cent	61,800	42,600
	104,800	70,600

TABLE B—EMPLOYEES NEEDED FOR A COAL-TAR DYE PLANT WITH A YEARLY CAPACITY OF 3,000,000 LBS.

	United States		Germany	
	Rate	Amount	Rate	Amount
1 general manager	$10,000	$10,000	$5,000	$5,000
2 head chemists	5,000	10,000	2,500	5,000
4 chemists	1,500	6,000	1,000	4,000
1 chemist	1,300	1,300	800	800
1 chemist	900	900	600	600
3 dyers	1,144	3,432	390	1,170
1 helper	468	468	160	160
1 helper	213	312	135	135
2 boys	208	416	78	156
1 head bookkeeper	2,500	2,500	1,200	1,200
1 clerk	1,800	1,800	900	900
1 clerk	1,200	1,200	600	600
3 clerks	900	2,700	450	1,350
1 clerk	780	780	350	350
2 boys	500	1,000	250	500
1 telephone operator	364	364	160	160
1 superintendent	1,560	1,560	750	750
1 shipping clerk	1,200	1,200	450	450
2 engineers	1,040	2,080	520	1,040
6 firemen	780	4,680	390	2,340
2 watchmen	728	1,456	390	780
2 teamsters	624	1,248	390	780
4 carpenters	780	3,120	390	1,500
2 machinists	936	1,872	468	936
2 blacksmiths	676	1,352	468	936
4 helpers	624	2,496	260	1,040
10 foremen	718	7,180	390	3,900
83 laborers	540	44,820	300	24,900
TOTAL		116,236		61,493

TABLE C—MATERIAL REQUIRED FOR 3,000,000 LBS. OF COAL-TAR DYES AND COST OF SAME

Chemicals Used	Quantities in lbs.	Cost in U. S. under Present tariff	Cost in U. S. under Proposed tariff	Cost in Germany
Nitrate soda	385,803	$29,899.74	$29,899.74	$23,919.79
Muriatic acid	1,369,125	10,268.43	10,268.43	8,214.74
Sulfuric acid	122,814	409.38	409.38	327.50
Carbonate soda	790,875	7,592.40	7,592.40	6,073.92
Caustic soda	111,942	2,417.94	2,417.94	1,934.35
Common salt	3,371,280	5,899.74	5,899.74	4,719.79
Sulfide sodium	4,800	65.61	65.61	52.49
Ammonia 26°	2,880	144.00	144.00	115.20
Mono-thyl-alpha-naphthylamine	4,437	1,668.30	1,387.89	1,110.31
Aniline oil	139,041	16,128.75	16,128.75	12,903.00
Paranitroaniline	68,445	16,426.80	13,680.00	10,951.20
H-acid	593,145	206,414.46	172,605.21	138,084.17
Alpha naphthylamine	54,270	4,205.94	4,205.94	3,364.75
R-salt	29,295	4,247.79	3,544.71	2,835.77
Amido-G—salt	35,910	9,605.91	7,989.96	6,391.96
Freund's acid	9,630	1,661.16	1,396.35	1,117.08
Cleve acid	4,032	695.52	584.64	467.71
Gamma acid	12,420	5,464.80	4,558.14	3,646.51
Salicylic acid	18,720	4,867.20	2,822.97	2,258.38
A B Sp Sa	47,952	5,591.19	5,072.22	4,057.78
A A Tm Ba	19,908	4,411.62	4,081.14	3,264.91
A A Bm Ba	104,625	22,965.18	21,228.09	16,982.47
A A Tm S	23,400	7,317.18	5,974.02	4,779.22
Tolidine	25,740	8,494.20	8,494.20	6,795.36
Benzidine	218,340	66,047.85	66,047.85	52,838.28
TOTAL	7,568,889	442,911.09	396,508.32	317,206.64

TABLE D—COST OF PRODUCING 3,000,000 LBS. OF COAL-TAR DYES

Materials, labor, fuel, etc.	When made in United States under present tariff	When made in United States under proposed tariff	When made in Germany
Materials	$442,911.09	$396,508.32	$317,206.64
Fuel	20,250.00	20,250.00	27,000.00
Labor	116,236.00	116,236.00	61,493.00
Interest on investment	61,800.00	61,800.00	42,600.00
Depreciation of plant	43,000.00	43,000.00	28,000.00
Taxes, fire insurance, and incidentals	8,000.00	8,000.00	4,000.00
	692,197.09	645,784.32	480,299.64
Per cent	144.1	134.4	100

TABLE E

PRESENT WORDING	NEW WORDING SUGGESTED
Sec. 15—Coal-tar dyes or colors, not specially provided for in this act, 30 per cent ad valorem; all other products or preparations of coal tar, not colors or dyes and not medicinal, not specially provided for in this act, 20 per cent ad valorem	Coal-tar dyes or colors, not specially provided for in this act, 40 per cent ad valorem.

Free List

Sec. 469—**Alizarin, natural or artificial, and dyes derived from alizarin or from anthracin.**	**No change suggested.**
Sec. 524—**Coal tar, crude, pitch of coal tar, and products of coal tar known as dead or creosote oil, benzol, toluol, naphthalin, xylol, phenol, cresol, xylidin, toluidine, cumidin, binitrotoluol, binitrobenzol, bendidin, tolidin, dianisidine, naphthol, naphthlyamin, diphenylamin, benzaldehyde, benzyl chloride, resorcin, nitrobenzol, and nitrotoluol; all the foregoing not medicinal and not colors or dyes.**	**Coal tar, crude, and all products or preparations of coal tar, not colors or dyes and not medicinal, not specially provided for in this act.**
Sec. 580—**Indigo.**	**No change suggested.**

In conclusion, we beg to state that the figures and tables contained in this document are taken from our books, and represent actual conditions, and if desired we are prepared to prove the correctness of same in every particular.

On a separate sheet annexed hereto, marked Table E, we suggest the wording of the sections in the tariff which we desire to have changed.

Respectfully submitted,

Schoellkopf, Hartford & Hanna Company,
The Heller & Merz Company.

p. 143. New York, November 20, 1908.

Hon. Sereno E. Payne,
Chairman Committee on Ways and Means,
House of Representatives.

At a meeting of the firms interested in and dealing in "coal-tar colors or dyes" and "coal-tar products not colors or dyes, not otherwise specially provided for," held here to-day, the following resolution was unanimously adopted:

Resolved, That we, the undersigned, protest against any increase in the duties on coal-tar colors or dyes, by whatever name known, or coal-tar products not colors or dyes, not otherwise specially provided for, and request an opportunity to be heard individually at such time and place as is convenient to the committee of Congress.

H. A. Metz & Co., H. A. Metz, *President.*
Cassella Color Company, G. W. J. Matheson.
Badische Company, Adolf Kuttroff, *President.*

FARBENFABRIKEN OF ELBERFELD COMPANY,
Y. Rellmerling, *President.*
A. KLIPSTEIN & Co., G. O. Klipstein, *Treasurer.*
BERLIN ANILINE WORKS,
E. O. Patz, *Second Vice-President.*
GEIGY ANILINE AND EXTRACT COMPANY,
Alfred Küblein, *Vice-President.*
WALTER F. SYKES & Co., Jno. A. McGuire, Attorney.
GEISENHEIMER & Co.
C. BISCHOFF & Co.
KALLE & Co. (incorporated), Wm. Junker, *Secretary.*

P. 146.

MEMORIAL AND PROTEST IN OPPOSITION TO ANY ADVANCE IN DUTIES ON COAL-TAR COLORS AND DYES

WASHINGTON, D. C., December 20, 1908.

COMMITTEE ON WAYS AND MEANS,
Washington, D. C.

GENTLEMEN: Your memorialists, cotton manufacturers, consumers of coal-tar dyes for the coloring of various cotton fabrics (the largest consuming industry of coal-tar dyes in the country) respectfully submit:

First. We desire to protest against any advance in the rates of duty on coal-tar dyes or colors under Section 15 of the present tariff on the ground that such advance would—

(*a*) Increase the cost of manufacturing colored cotton goods in the United States.

(*b*) Increase the price to the consumer in the United States.

(*c*) In the case of export trade an advance in the cost of any of our raw materials adds to our burden and minimizes our opportunity to compete with foreign cotton manufacturers in foreign markets.

Second. We further petition that, for the same reasons, alizarines and dyes derived from alizarin and anthracene, as well as indigo, be left upon the free list, and that no change be made in the following schedules now on the free list:

Section 468. Alizarin, natural or artificial, and dyes derived from alizarine or from anthracene.

Section 580. Indigo (meaning vegetable and synthetic).

Very respectfully,

AMOSKEAG MFG. CO.,
F. C. Dumaine, *Treasurer,* Manchester, N. H.
HAMILTON MFG. CO.,
Franklin D. William, *Assistant Treasurer,* Lowell, Mass.
PACIFIC MILLS,
Edwin F. Greene, *Treasurer,* Lawrence, Mass.
MASSACHUSETTS COTTON MILLS,
Edward Lovering, *Treasurer,* Lowell, Mass.
MERRIMACK MFG. CO.,
Herbert Lyman, *Treasurer,* Lowell, Mass.
COCHECO MFG. CO.,
H. DeF. Lockwood, *Treasurer,* Dover, N. H.
AMERICAN PRINTING CO.,
B. H. Borden, *Treasurer,* Fall River, Mass.
THE UNITED STATES FINISHING CO.,
J. H. Wright, *President,* New York.
THE APPONAUG CO.,
J. H. Wright, *President,* Apponaug, R. I.
GARNER & CO.,
Oscar Hutley, *Vice-President,* Pleasant Valley, N. Y.
PASSAIC PRINT WORKS,
Edward E. Poor, *Treasurer,* Passaic, N. J.
ARNOLD PRINT WORKS,
W. A. Gallup, *Treasurer,* North Adams, Mass.
WINDSOR PRINT WORKS,
D. A. Russell, *General Manager,* North Adams, Mass.
RENFREW MFG. CO.,
Ira S. Ball, *Assistant Treasurer,* Adams, Mass.
QUEEN DYEING CO.,
B. J. Horton, *Treasurer,* Providence, R. I.
S. H. GREENE & SONS CORPORATION,
Francis W. Greene, *Treasurer,* Riverpoint, R. I.
THE ASPINOOK CO.,
L. Johnson, *Treasurer,* Jewett City, Conn.

The hearings of 1913 both before the Committee on Ways and Means and the Senate Finance Committee were of the same general tenor as the statements just given.

The duties on coal-tar dyes in the different tariff revisions were:

1864—Anilin dyes, $1.00 per lb. and 35 per cent.
1870—Anilin dyes, 50c. per lb. and 35 per cent.
1883—Anilin dyes, 35 per cent. Alizarin, free.
    Anilin oil and saults, free. Indigo, free.
1890—Same as 1883, with alizarin *dyes* added to Free List.
1894—Coal-tar dyes, 25 per cent.
    Alizarin dyes and indigo, free.
    Anilin oil and salt, free.
1897—Coal-tar dyes, 30 per cent.
    Alizarin dyes and indigo, free.
    Anilin oil and salt, free.
1909—Same as 1897.
1913—Alizarin and alizarin dyes, free.
    Indigo and indigo dyes, free.
    Anilin oil and salts, toluidin, xylidin, etc., 10 per cent.
    Coal-tar dyes, 30 per cent.
    Carbazol dyes, free.

It is therefore clear, in the light of the above tariff-enactments, that the preceding arguments of dye-users *against* suitable tariff-enactments on coal-tar dyes so as to enable their manufacture in this country, were more persuasive with Congress than the arguments of domestic dye and chemical makers *on behalf* of such favorable tariff-enactments.

Will the awakening of the American public since August, 1914, alter this situation?

The Aniline Dye Situation

Address Before the National Exposition of Chemical Industries, New Grand Central Palace, New York, September 22nd, 1915.

I. F. STONE

MR. CHAIRMAN AND GENTLEMEN:

Everybody Knows the Situation.

80% of Colors Come from Europe.

20% of Colors Made in U. S.

In rising to speak of the aniline dye condition in the United States at this time, it is perhaps needless to repeat what is already known to those who are interested in aniline colors either as merchants or consumers, and, in fact, known to many of the public through the newspapers; that there is a very great shortage in supplies owing to the fact that goods, which formerly came from Europe, upon which we depended largely for our supplies, are by reason of the war no longer sent over; therefore, American consumers are not able to get anything like the supply to which they have been accustomed and upon which they depended. Eighty per cent of the colors consumed in the United States were brought over from Europe, principally from Germany, so that upon the stoppage of the imports from Europe, eighty per cent of the supply would naturally disappear. The other twenty per cent had been furnished largely by American manufacturers, but even this twenty per cent of the supply has not been maintained by the American manufacturers because they have been depending upon Europe for a large part of their intermediate or raw products, and when they were no longer able to get these products from Europe, naturally they could only run their factories as long as their stock on hand would enable them to do so. Their only chance then, to continue running their factories, was to make these raw or intermediate products themselves, and while this has been done to some extent, as I will explain later, it has not yet reached a stage where they can get full supplies of every raw material they need to produce the full line of colors which they have been manufacturing. Consequently they are unable to furnish some of the colors which they formerly supplied.

Consumer's Position.

Hosiery and Leather Manufacturers Taken Care Of.

Other Manufacturers Not Able to Secure Colors.

This, you will see, leaves the consumer in a very critical position, as if he wishes to run his factory, he must do so without his usual colors, meaning that he would have to make a different class of goods as far as colors are concerned, or else only operate part time, or close down altogether for lack of these dyes. Most of the factories have adopted the part time method, in that they are manufacturing such goods as require little or no dyestuff, or else manufacturing such goods for which they can secure colors in America to manufacture. In some lines, for instance the hosiery and possibly the leather manufacturers, this can be done to quite a large extent, as they use mostly blacks and other dark colors which are manufactured comparatively largely here: that is, for hosiery, direct and sulphur blacks, and for leather, blacks, nigrosines and logwoods; which can be obtained here almost in the necessary quantities. Other lines of manufacture, however, requiring indigo, alizarines and other fast colors, paint and printing ink manufactures requiring special colors for their lakes to make their paints and printing inks, paper manufactures requiring large quantities of blue to manufacture white paper and fancy shades, and many other industries not mentioned, are unable to obtain anything like their requirements and are accordingly not doing their usual volume of business, and many employees are therefore working only part time at a consequent great loss to themselves, and to their employers.

Reason for the Situation.

The reason for this acute situation is manifestly, of course, the present European war, but, as a matter of fact, it could have been avoided largely by what I might call better judgment of two nations, viz., Germany and the United States. In explaining the situation I shall perhaps have to say something which will reflect upon the business methods of one nation—the German—and the political methods of the other nation—the United States. But whatever I do say will be without animosity, and simply a plain statement of facts, and should be taken as such.

Germany Responsible for Present Conditions.

At the beginning of the war, it was of course impossible for the German factories to ship their usual quantities over here because of the fact that the German government had taken charge of all the railroads and other means of transportation for moving their troops and war supplies, and the German factories could not therefore get their colors to seaport for shipment; but after a couple of months this condition changed so that they were able to get their goods to the seaport and did commence to make quite good size shipments to the United States owing to the fact that they were able to do so on neutral or American vessels and there was then no interference with these shipments on the part of England. The first large shipment, for instance, was made on the S. S. "Matanzas," which was chartered by American firms and sent over specially for the bringing over of dyestuffs, and this vessel subsequently made several other trips. After this followed many other chartered vessels and comparatively regular shipments were made until the Spring of this year, when they ceased completely for the reason I believe partly of the action of England in taking measures to prevent such shipments, and partly because the Germans were disinclined to make shipment when they could not get anything in return from this country, cotton and foodstuffs for instance. Had, however, the German firms taken advantage of the time when they could make shipments and had sent to this country a large supply of their products, their agents here could have accumulated large stocks which would have carried them over a long time and so largely prevented the acute shortage of the present time. But for reasons best known to themselves, they decided to ship to this country each month only about seventy-five per cent of their regular normal shipments, consequently a shortage of at least twenty-five per cent and perhaps more continued in spite of the German shipments. When I say that the German factories could have made large shipments I say this for the reason that normally only

German Reason for Not Shipping

about twenty per cent of their production was shipped to the United States, while the other eighty per cent was used in their own country and shipped to other parts of the world, and as at the time of the war they were barred from shipping to other parts of the world, a large percentage of their eighty per cent was available for shipment to the United States and they could therefore have shipped to us many time the quantity they did ship, and if they had done so their American agents might have acquired a stock which would take care of their customers for perhaps a couple of years or more on some, if not all of the colors. I say, therefore, that the German firms are responsible for the difficulty and the acute position of the American consumers. Their primary reason for this holding back of shipments was probably due to the fact that they did not want American consumers to get an oversupply of colors so that they could make up extra quantities of goods which they might use for export to customers in other countries who had formerly bought the same goods from Germany, but who could no longer obtain them. Therefore, they restricted as far as they could the American supply so that they would only have enough goods to supply what might be called their normal trade and could not increase their production.

Raw Products.

On the intermediate or raw products which they had formerly shipped to American color factories, an embargo was immediately placed by the German government, so that they could no longer be shipped, the embargo being apparently for the reason that many of these materials were for the use of manufacturing explosives which were required by the German government in their war movements, but as a matter of fact, many of them, like aniline oil, beta naphthol, paranitranilin, naphthalin, and such articles, were not so necessary for this purpose, and large quantities of these could easily have been shipped over here and used in the manufacture of colors by American factories, and also in many cases by consumers themselves, as for instance aniline oil for blacks, and paranitranilin and beta naphthol for manufacture of colors by paint maufacturers.

German Chemical Committee.

The movement of German colors and intermediate products and chemicals was really controlled by a committee called Verein zur Wahrung der Interessen der Deutschen Chemischen Industrie, the chairman of which I understand was a director of one of the large German color factories, and the reason then that larger quantities of various products were not sent when they could have been sent, was evidently due to the judgment of this committee in reducing and finally stopping, because they considered it to the best interests of their manufacture to do so, for reasons already partially explained, and they therefore are really responsible for the present acute condition of the aniline dye supply in this country. Whether or not it was really to their advantage to take this position, it certainly was not to the advantage of American consumers, therefore in the future it seems to me they should bear in mind the position taken by German manufacturers in that the American consumers' position was not considered, and in the future ally themselves as far as they can with American manufacturers who are developing or about to develop the manufacture of aniline dyes in America to as large extent as may be possible, or to a comparatively small extent if the American Government does not come to their support by fixing a new and higher tariff on these goods so that American manufacturers can compete with Europe under normal conditions, but to a large extent if such protection is given.

American Consumers Should Now Stick to American Products.

Tariff Protection Crux of Situation.

This is really the crux of the whole situation as far as American manufacturers are concerned; viz., whether or not they will be given proper protection, and if so, as I have said, the business will develop to a large extent and in the course of time be practically independent of foreign supplies. I made this same statement in a circular which our company issued on the 1st of September, 1914, just a month after the war started, that is, that the American manufacturers could not make much progress without such protection, which I again repeated in an address before the American Chemical Society of New York on October 9th, 1914. As a result of this address, a committee was appointed by the American Chemical Society to look into the

New Tariff Proposed by American Chemical Society.

matter, and this committee subsequently reported on November 6th, 1914, that such protection was necessary and advocated that the present duty of 30 per cent ad valorem be continued, with an additional duty of 7½c. per pound specific on finished colors, and an ad valorem duty of 15 per cent and 3¾c. per pound specific on the intermediate or what might be called half finished products. This necessity was so apparent that it was even signed by one of the committee, Mr. H. A. Metz, who is the American representative of a large German color factory, whose personal interests naturally lie in the importation of colors, and who would not have signed it had it not been absolutely a necessary action if the development of the color business were to be largely increased in the United States. This resolution, or report, was duly sent to the proper authorities in Washington, and has been on file there since that time. It is a reflection, I think, on the American Government that no action whatever has been taken in this matter, but here comes a question of politics, the present Administration having been elected on the platform advocating reduced tariffs and therefore will not apparently go back on their platform, even under the present unusual and unexpected conditions, even though American consumers are suffering for relief, in that many thousand employees of manufacturers requiring colors, are reduced to only part time and, in fact, some of them laid off entirely by reason of their employers not being able to secure the necessary amount of dyestuffs to continue their regular productions.

Reflection on American Government.

Question Not a Political One.

In other words, the position of American consumers at present is not a political one, but one of cold fact, and should in my opinion have the attention of the Administration irrespective of previous policies. Except that they have had practical example of the workings of a low tariff on aniline colors and coal tar products, and its flat failure as connected with this line of business, the result of which is the present deplorable condition; the present Administration is no different from previous Administrations for the last 25 or 30 years, both Republican and Democratic, none of them having given this necessary protection, and as a result not allowing the business to develop as it would have developed had they done so. It is perhaps some excuse that they did not realize how large a part in the success of the manufactures of textiles, leather, paints, and many other lines, depended on their supply of dyestuffs, in that the business itself was perhaps not large enough to demand their careful attention, and they did not take into consideration the fact that so many other great lines depended on their supply of these goods. This fact was also not realized by many of the American consumers themselves, as is evidenced by the fact that during the many years that the tariff matters were before successive administrations, many American consumers of dyestuffs fought an increase of duty thinking that it might increase their costs and evidently preferring to buy foreign goods at what they considered lower prices than to support the manufacture in America at a possible increase in cost to themselves by reason of a higher protection. The fallacy of this position is now absolutely apparent in that the consumers are now not only not able to get sufficient supplies for their wants, but on what they do get are forced to pay fabulous prices, and certainly the extra cost of their supplies and their losses through failure to run their factories regularly, will far exceed a slight possible advance in the cost of dyestuffs by reason of their being made in America under a protective tariff.

Mistake of Some American Consumers.

As an instance of prices which they are forced to pay when they do get goods, I might mention a few products:

Sulphur Black, which is used very largely by the hosiery and cotton trades, and which sells normally at about 20c. per lb., has brought as high as $2.75 and even $3.00 per lb.

Fabulous Prices now Paid for Foreign Products.

Indigo, which sold formerly at about 15c., has been sold as high as $1.00 per lb., even more.

Aniline Oil, the normal price of which is about 10c., as high as $1.75 per lb.

Beta Naphthol, the normal price about 12c., selling as high as $1.50.

Paranitranilin, normally about 15c., selling as high as $1.75, and I might continue this list indefinitely showing where all products for which consumers depended on European supply, that is, which were not manufactured here, are now selling at anywhere from five to twenty times their normal value. I might call attention in this connection to the fact that these enormous advances do not apply on colors and products which were made regularly in America; for instance, such products as direct black, Bismarck Brown, Chrysoidine, Nigrosine, and any number of other colors, have not been advanced by American manufacturers more than two to three times their normal selling price, and this advance was only caused by reason of the fact that their raw materials are also used in the manufacture of ammunition and explosives, and are now in large demand for this purpose, so large a demand, in fact, that American manufacturers of colors have been unable to get adequate supplies, and for what they do get pay abnormal prices; benzole, for instance, having advanced from a normal price of about 20c. to as high as $1.25 for immediate shipment, and on contract to about 65c. at the present time; while toluole, with a normal price of about 25c., has been sold as high as $6.00 for immediate supply, and on contract at this time about $4.25. Had these advances not taken place by reason of their demand for other purposes, the manufacture of American colors could have been continued on almost normal lines, so they are not to blame for the necessity for advancing prices to the extent they have, which, however, is no comparison to the advance in the prices of European colors which have not been made here. I might say that the one American manufacturer of aniline oil before the war, even in the face of these enormous advances, continued to fill contracts at the old contract prices, and when they arranged to increase their production to a large extent, only advanced their price in proportion to the advance in raw materials, and had they only been able to manufacture enough aniline oil to supply the country, which they were not at the time, the price on this article would not have soared to $1.75 as it has, but would have been held to some reasonable figures. This shows the policy of real American manufacturers, which is to protect their customers as far as possible under unusual conditions, and has also been the policy of color manufacturers.

American Products not Advanced so Much.

Tariff Literature. The matter of tariff being so important a factor in the development of the color business in the United States, I might call your attention to an article recently written by Dr. B. C. Hesse, a well-known aniline expert, and published in pamphlet form, headed, "Who Killed Cock Robin?" and which gives the United States tariff history for the past thirty years. He calls attention to the fact that there was from 1880 to 1883 a duty of 35 per cent ad valorem and 50c. per lb. specific on aniline colors, which gave ample protection to the industry, and as a consequence there were then nine or ten factories in the United States, and the prospect of becoming independent of other nations for our supply of these aniline products was bright indeed, but the passage of the Tariff Act of July 1st, 1883, which abolished the specific duty of 50c. per lb, leaving only the ad valorem duty of 35 per cent and fixing a 20 per cent duty on the intermediate products, which left only a net protection of 15 per cent, immediately checked the industry here. No new factories were started, and within one year after the new tariff took effect, five of those already established were forced to succumb and go out of business, leaving only four to continue the work, who have since stayed in business, but have not been able to develop to any extent. I might say that a specific duty of 50c. at that time was not exorbitant, as the prices of aniline colors then manufactured were very much more than they are to-day, colors for instance selling at $4.00 to $5.00 per lb. now sell at only 50/60c. per lb., so that the 7½c. specific duty now recommended by the American Chemical Society would not be very far out of proportion to the 50c. per lb. at that time.

Had a proper duty been kept on these aniline products, say from 1883 to about 1900, during what might be called **Golden Days.** the golden progress of the industry, when so many new colors and products were brought out, the business might be here to-day in the same prosperous condition as it has been in Germany, whereas, as everybody knows, enormous factories have been erected and the business of the world practically controlled by them. It is, of course, due to the Germans to say that many of their new products were patented colors produced through the careful research work of their chemists, but no one can say that American chemists would not have been equally diligent in research work had they had the same opportunities, and not only that, had the United States at that time had a proper patent law which would compel the manufacture in this country of all goods patented by foreign residents, it would have protected the industry and insured its great success. Our legislature, however, did not appreciate the importance of the business, and so failed to give us the proper protection and proper patent laws, and therefore the business has drifted away from the United States, and resulted to the great credit and prosperity of the German manufacturers. However, these patents have now practically expired, and the American manufacturers are free to manufacture practically everything that is needed, so I must emphasize again that it is now only an insufficient tariff which prevents the development of the American industry in the future. This pamphlet of Dr. Hesse's also shows that in the various tariff administrations, fights against an increased tariff were made not only by foreign manufacturers and their representatives, but were actually supported by American manufacturers and consumers whose names are given, and who are now I think very sorry that they took this position, and did not rather favor a protection and development of the American industry.

Patent Laws.

Manufacturers Dependent on Colors.

To show you the lines of manufactures which are dependent on their supply of dyestuffs, to continue their regular production, I would say the most important, perhaps, are the textile manufacturers, comprising cotton, wool, carpets, knit goods, silk, cordage, shoddy dyeing and finishing. The following figures are taken from the census of 1909:

	Establishments	Employees	Capital	Salaries and Wages	Value of Product
Dyeing and Finishing	426	47,303	114,092,654	26,261,634	83,556,432
Wool	985	175,176	430,578,574	82,523,776	435,978,558
Carpets	139	34,706	75,627,010	17,745,092	71,188,152
Knit Goods	1,374	136,130	163,641,171	52,431,680	200,143,527
Silk	852	105,238	152,158,002	46,097,364	196,911,667
Cordage	164	27,214	76,020,366	10,995,545	61,019,986
Shoddy	88	2,320	6,886,825	1,196,376	7,446,364
Cotton	1,324	387,771	$822,237,529	$147,470,903	$628,391,813
	5,352	915,858	$1,841,242,131	$384,522,370	$1,684,636,499

You will see that there are over five thousand of these establishments with over nine hundred thousand employees, with a capital invested of $1,841,242,151, who are paying in wages annually $384,522,370, and the value of whose product is $1,684,636,499.

Then there are the leather manufacturers and tanners, of which there are over nine hundred establishments, with a capital of $322,726,952, employing over 62,000 people, and the value of whose production is $327,874,187.

Then again there are the paper manufacturers, numbering over seven hundred and fifty, with over 81,000 employees, with capital invested of over four hundred million dollars, and the value of whose product is over two hundred and sixty million dollars.

Then there are the paint and color manufacturers, about nine hundred in number, with a combined capital of about two hundred and fifty million dollars, and employing thirty thousand men.

2,000,000 People Dependent on Color Supply for Employment.

As I said at first, these figures are taken from the census of 1909, and those who are interested in these particular lines tell me that there has been an increase in practically every industry averaging about twenty-five per cent., so that the figures should be something like twenty per cent. more than those given. Add to these lines of business, others which are not separated in the census, such as printing, and writing ink manufactures, shoe dressing manufactures, and a hundred and one other lines which consume dyestuffs, and I think I could safely say there are upwards of two million people employed in industries which require the use of dyestuffs, and who are now affected by the present shortage. Others affected, of course, not so directly, are the public generally, who will soon find that they cannot get what they want, and will have to take what they can get, and if some changes do not take place very shortly, a totally new scheme in colors will have to be presented to the American public.

We have now come to a point where we are under unusual conditions, and the American industry again has a chance to develop, and it would seem a pity if the present Administration would not take the opportunity to help manufacturers to do so.

Attitude of Prominent Newspapers

The *New York Sun,* in its edition of September 3rd, had a good article on the subject, and an editorial calling the attention of the President to the fact that while he might be engrossed in very serious affairs such as the Mexican situation and the foreign wars, at the same time the new conditions and new complications arising from the present conditions, should warrant his attention, to see what prompt action and judicious protective legislation in the matter of the dyestuff industry, might do for the country, saying further that the dyestuff industry is a single illustration only of the great trade advantages which the situation promises. This article and editorial were repeated and supported by many other American newspapers, and certainly is a step towards accomplishing a revision of the tariff on aniline products, to take advantage of present conditions.

Mistake to Believe Higher Tariff Increase Prices

I might at this time call attention to a popular belief, which I consider a mistake, that an advance in the tariff on aniline products would necessarily result in advance of prices, but this is open to question, as while it is true that many of the cheaper colors might be advanced to some extent, on the other hand the higher-priced colors, which have not been made in America and which are controlled by European conventions, would probably be actually reduced in price so that the general average price on everything would not be possibly much different from what it is to-day, under normal conditions. Then again, there is the question of the so-called "Anti-dumping Clause," referring to the fact that it has been the habit of European manufacturers to sell in this country colors which were made here, at lower prices than they sold them in other countries, so as to prevent their development here, while at the same time they held prices at good figures on colors which are not made here, and so averaged up their profits. I am glad to say that some legislation against these proceedings is favorably considered by the present Administration, and no doubt some law will be passed which will prohibit this so-called dumping in the future.

In view of the emphasis I have placed on the necessity of tariff legislation, it may interest you to know what I have discovered in my interviews with various administration officials, to get their ideas on the subject.

The Government's Attitude.

Some months ago, Secretary Lane of the Interior Department, called a meeting of the various chemical manufacturers, to get their ideas as to the situation, and what was to be done about it, and at that meeting what little I said was to the same effect as what I am now saying, viz., the necessity of tariff action. Mr. Lane made the observation that if this were done it would create in this country a great monopoly or trust and he did not think it would be advisable, but as a matter of fact the lack of this legislation has simply resulted in a great trust or monopoly in Germany, so I could not see where there could be any reason in this point. Such legislation would not necessarily create a monopoly here, as any one would be open to go into the business; the only point being that it would put us on equal terms with foreign competition, and this is the only result desired—not monopoly. Mr. Lane further said, however, that the matter would probably be put in the hands of the Department of Commerce, which eventually it was. Some time afterwards I called on Secretary Redfield of the Department of Commerce, and found that he was very sanguine of the ability of American manufacturers through their ingenuity and ability to create this business without help of a tariff, and instanced a number of new concerns who had started in the business since the war commenced, but as I knew most of these parties through previous inquiry, I told him they were not being established for the manufacture of colors, but simply for such intermediate products as aniline oil, carbolic acid, beta naphthol, and paranitranilin, which are more easily manufactured, and while they might be profitable under war conditions, could not possibly exist under normal conditions, which I believe is true. Mr. Redfield was very much interested in the matter, and said that his Department was doing everything possible to foster the development of the business in the United States, but could not say that he was in favor of higher tariff, as it was

Mr. Redfield's Interest.

against his policy and against the policy of the present Administration, but that he was in favor of some anti-dumping legislation, which would prevent the selling in this country of European colors at lower prices than to other countries, and he thought something would be done in this line to prevent it in the future.

Dr. Norton Admits Some Colors Need Protection.

Notwithstanding the fact, however, that the Administration, as represented by Secretaries Lane and Redfield, are apparently opposed to higher tariff, is the fact that in the meantime, in fact only a day or two ago, Dr. Thomas H. Norton, special representative of the Department of Commerce, gave his views on dyestuff tariff in the *New York Sun* and in the *New York Herald* of September 15th, admitting that in spite of the fact that he does not think the general line of colors need any more protection he does feel that some of them, like indigo, alizarine, and others which are on the free list, should have some protection to be successfully made here, and if he were to go a little more carefully into the matter would find that while thirty per cent duty on the ordinary aniline colors might be sufficient, if it were a clear protection, as a matter of fact the intermediate and raw products which are used in this manufacture, carry a duty of 10/15 per cent, so that the real protection on aniline colors is not half what it apparently is in the Bill. If it were possible to buy these raw materials made in the United States at approximately the same prices at which they can be bought in Germany, then the 30 per cent tariff would be more or less effective, but for reasons just mentioned, i. e., the duty on the intermediate products, it is not, and to show that this is a positive fact, without any theories, I would again call attention to the fact that since 1885 there have been practically no new color factories started in the United States, and the great business developed since that time all over the world, has been practically controlled by Germany. If these colors had been properly protected, as I have already said, then a large part at least of this great business would have stayed in the United States, and now that we have again a chance to get to a quick development through the present abnormal conditions, certainly we should not throw away another chance to become a great factor in the industry, and no longer dependent upon foreign countries for our supplies.

In the tariff pamphlet by Dr. Hesse already mentioned, there is a copy of a brief filed with the Congressional Committee, who were working on a new tariff in 1908. This brief is dated November 9th, 1908, and is a complete statement of the cost and operation of an aniline color plant designated to manufacture three million pounds annually. It was written and filed by Mr. J. F. Schoellkopf of the Schoellkopf, Hartford & Hanna Company, now called Schoellkopf Aniline & Chemical Works, and is confirmed and also signed by the Heller & Merz Company, one of the largest and oldest color manufacturers in the United States.

Mr. Schoellkopf's Comparison of German and American Color Manufacture.

In Table A of this brief it is shown in detail that the cost of such a plant would be $104,000 in the United States and $70,000 in Germany, a difference of $34,000 in favor of Germany.

In Table B the number of employees needed to operate such a plant is given in detail, and shows that their wages would amount to $116,236 in the United States against $61,493 in Germany, again a difference in favor of Germany of $55,000.

In Table C, a list of the cost of the material required for running this factory to a three million pounds capacity is given, showing that the cost in the United States for these materials, which are given in detail, would be $443,000, while in Germany the same materials would cost only $317,000, a difference of $126,000 in favor of Germany.

In Table D is given the cost of producing the colors as a whole, adding together materials, fuel, labor, interest on investment, depreciation of plant, etc., the table amounting to $693,000 in the United States, where it would only cost in Germany $480,000, a difference of $212,000 in favor of Germany.

German Cost 44% Less than American.

The net result as shown by these figures is that it actually costs 44 per cent less in Germany to make colors than it does in the United States, and while of course these figures are now somewhat old, I think this same difference would still be true at the present time.

Take, however, the possibility that the present manufacturers are not correct in their statements as to this increase of duty being necessary, let us take the opinion of two possible new manufacturers; for instance, Mr. Thomas A. Edison, who when the war started found that he could no longer get the large amount of carbolic acid which he consumed, and which was formerly furnished from Europe, and he promptly started to manufacture it himself, first making an arrangement with a large steel works for the benzole to make it from. In making the carbolic acid he also decided to produce aniline oil, and has been a producer of these products for some time. It was rumored at that time that he also intended to take up the manufacture of aniline colors, and this same rumor has been repeated in the public press in the last few days. Now, in an interview with him, published in a recent edition of the *Journal of Commerce,* he is quoted as saying that we can only become independent of Germany in the dyestuff industry if Congress will allow a moderate tariff, confirming the opinion of older manufacturers, and showing that after looking into the matter he was convinced that colors or coal tar products could not be manufactured successfully here in competition with Europe unless they had the proper protection.

Views of New Manufacturers

Then the Pearsite Company of Cannel, Kentucky, who have lately been extolled as having a marvelous new process for manufacturing aniline colors by which they could manufacture them cheaper than the Germans, and would soon control the entire consumption of the United States, gave an interview in the *New York Times* of September 9th, by Colonel H. P. Bope, who is their President and also Vice-President of the Carnegie Steel Company. Mr. Bope states in answer to a question as to whether their company could continue to compete with Europeans under normal conditions, that he believed that the men in charge of affairs at Washington would readily see the necessity for, and would give them the protection in tariffs that comes to all American industries, so you will see that Colonel Bope's mind was also running on the line of protection in spite of the fact that the supposed new method of manufacture would entirely alter the whole situation.

What the Department of Commerce is Doing.

Now, to come back to what the Government, through the Department of Commerce, are trying to do to help the production of dyestuffs in the United States, aside from any question of tariff, and we find that while they are working diligently to do what they can, they are starting from an entirely wrong point of view in that instead of trying to help the present manufacturers in the way for instance of securing them very much needed raw material, and other helps to their production, they seem to be paying more attention to possible new productions, and to the claims of people who think they have wonderful new methods for producing dyestuffs, which will render us independent of Europe for all time.

The first reports sent out by the Department were to the effect that many new concerns were entering the field, which I have already mentioned in the account of my interview with Mr. Redfield, but it turned out that these concerns were not intending to make aniline colors, but only intermediate products.

Then the next reports of any interest were to the effect that they were working on agreement with the Swiss manufacturers whereby we were to send over to that country raw materials, and the Swiss manufacturers were to make them up into colors and return them to us. That this arrangement has failed of any result is very natural, because the United States did not have the raw material to send, in fact, its own manufacturers could not get enough for their own wants, and if there had been any raw materials available, it would have been much better for us to have given them to American factories instead of sending them to Switzerland. My own firm has recently had correspondence with Swiss manufacturers relative to furnishing them such articles as benzole, aniline oil, acetate of lime, and oleum (which is sulphuric acid), stating they were unable to obtain supplies abroad, and we were obliged to write them that we could not get supplies ourselves, therefore could not send them anything from here. Aniline oil and oleum are out of the question owing to the immense demand for them from American consumers, and benzole is practically barred because of its extreme high price, and the enormous transportation charges for carrying it to Switzerland, which brought the total up to more than they are willing to pay.

New Method of Manufacture Announced.

The next what we might call important or interesting news given out by the Department of Commerce was an announcement in the *New York Times* of September 4th, in which it was stated in an interview with Dr. Norton, special agent for the Department in New York, that an American had solved our dye problem, in that he had invented a new process for manufacturing colors which was much cheaper than the old process, and which would allow his factory to revolutionize the business in the way of costs and production, and that production might begin within two weeks, with a possible production of five tons per day, or 35,000,000 pounds per year—the total consumption of the United States, by the way, being about thirty million. The name of the concern who were to make these new colors was not given, but the next day in the *Times* edition of September 5th, it was stated that the firm who would manufacture colors by the new process was the Pearsite Company, who had erected large works at Cannel, Kentucky, and again repeated, with Dr. Norton's approval, that it would be ready to produce dyes in a few weeks, again mentioning five tons daily as its probable production, and further interviews with Dr. Norton on the subject were continued for several days, all to the effect that these new colors would be in the market in a few weeks in the quantities mentioned and would revolutionize the dyestuff conditions of the United States, and relieve consumers from the present shortage. I immediately received letters from all parts of the United States, asking if we knew anything about the process and if it were true that colors could be had from this new company in so short a time, to which I replied that I did not know anything about it, except the newspaper reports, but that I doubted if it were possible for such a marvelous change to take place so quickly. Later, however, I have been in communication with parties who have actually had dyed samples and tried out the new colors, but instead of having an unlimited line of complicated colors such as are required by the United States consumers, some nine hundred in all, and which would be needed, a good many of them, to relieve the present shortage, the new company really only had five colors to begin with, this being also confirmed by an article in the *New York Times* of September 15th, stating that this would be the number of colors to be produced and giving the names of the new selling agents for these colors. The point to this matter is simply that instead of a marvelous new discovery which would alter the present conditions and relieve the present shortage of colors, as announced by the Department of Commerce through Dr. Norton, we simply have an experimental proposition which will not relieve the situation to any particular extent. I do not question but that this Pearsite Company may have some method of making colors which will produce colors, but I do say that it is impossible for them to have a method which would enable them to make all of the complicated colors consumed in this country and which are made not only from their base — benzole — but many other raw materials which are combined with coal tar products, but which are not related to them at all, and which they could not possibly manufacture from a coal tar process alone. I do not believe that the Department of Commerce should allow such exaggerated statements to appear in the public press through their intervention, as it simply results in great disappointment to American consumers, who were hopeful that something had been found at last to supply their wants.

Department of Commerce Should Not Send Out Misleading Reports.

Mr. Redfield now says in an article in the *New York Sun* of September 16th that "home dyes will be plenty soon," which if one did not know the conditions would again build up the hopes of consumers, while unfortunately there is no immediate relief in sight, and it must be months before a full quantity of dyestuffs can be obtained, even after the war is over. American consumers must understand this and take it into their calculations in figuring on their future production, and such statements should not be sent out by the Department of Commerce.

Up to the present time I have mentioned the cause of the present shortage, the reason for and hope for a development in the manufacture of colors in America through tariff corrections on the part of the Government, and the attempt on the part of the Department of Commerce to create a new supply through other than ordinary methods, which, however, up to date has failed to produce anything of importance, so now I will tell you what actually has been accomplished by American manufacturers to increase the production of American products in the United States, and those who have aided in this development are firms who will continue in business after the war is over no matter what the conditions may be, even though they may have to do so at little or no profit unless they have some help from the Government. I am glad to say, however, that the development of the coal tar product business in this country will continue to a large extent, irrespective of what the tariff decision may be, but the development will not be anything like as large if the tariff is not corrected as it would be if it were.

What Has Actually Been Accomplished By American Manufacturers

ANILINE COLORS:—There were five factories actually engaged in the manufacture of these products before the war, the names and locations being as follows:

Schoellkopf Aniline & Chemical Works, Inc., Buffalo
(National Aniline & Chemical Co. selling agents)
The Hudson River Aniline Color Works, Albany
(Bayer Co. selling agents).
Heller & Merz Co., Newark, N. J.
Central Dyestuff & Chemical Co., Newark, N. J.
W. Beckers Aniline & Chemical Works, Brooklyn.

When the war started, and the shortage of foreign goods became apparent, these firms were overwhelmed with orders from American consumers for supplies. For reasons which I have already mentioned, viz., their inability to get raw material from Europe, they were not able in the beginning to increase their production, and were compelled to use only the raw material which they had on hand, and when this was exhausted had to give up some colors entirely. In the meantime, however, some of them have commenced to manufacture these intermediate products, and the rest will undoubtedly do so as quickly as possible. Although I cannot speak specifically for any other factory, I can say that our own factory, Schoellkopf Aniline & Chemical Works of Buffalo, by the 1st of January will be making largely its own raw material, and this, together with what raw material we can get from other manufacturers, has enabled us to insure ourselves of a supply of raw material, so that we have increased our regular aniline products to the extent that by the 1st of January we will be producing something like 800,000 to a million pounds monthly, or say ten million pounds annually, which is about four times our former production. While, as I have just said, I cannot speak specifically for other factories, I have no doubt they are making equal improvements, and will show equal increase in production in the course of time.

It is my opinion that an immediate development in the aniline color business in this country will depend entirely on these five original makers, as they are all equipped with capable and experienced men who are able to direct much larger production than they are now getting, and to manufacture successfully, which is a great advantage they have over new factories which may enter the field, who have not the experienced and necessary scientific help to develop the business quickly, and these factories, while having no connection one with another and no conventions nor understandings of any kind, are a unit in declaring that they must have additional protection in order to develop their business to an extent which would take care of the consumption of the United States.

Other large corporations like the E. I. du Pont de Nemours Powder Company, the General Chemical Company, and Thomas A. Edison, have been recently mentioned as about to enter the manufacture of aniline colors, but I question if they have any intention of doing so in the immediate future, as their present business is so large and the demands upon them so severe, that they will hardly be able to entertain taking up new lines in the near future, another difficulty being the inability of any of us or them to secure at present enough raw materials to manufacture even the amount of colors we could manufacture if raw materials were plentiful. For instance, one article, oleum, which is a concentrated sulphuric acid, and which enters largely into the manufacture of colors, is almost unobtainable owing to the enormous increase in its demand, due to present war conditions, which require large quantities of it for explosive purposes, and unless sufficient quantities of it could be secured the deevlopment of the manufacture of colors could not be carried on by anybody. Of course the present aniline works have arranged for their supply of this product now, in advance, so have enough in sight to enlarge their production to the extent which I have mentioned, but for a new concern to start in at this time, I think it would be impossible for them to get this, as well as other raw material, which is absolutely necessary, and for this reason, as I said before, I think it rests with the original five color makers to develop the business for the relief of consumers, and while other concerns like those mentioned may enter the field later, it certainly will not be in time to improve matters much for a year at least. Two other concerns have been mentioned prominently in the papers of late in connection with the actual manufacture of aniline colors, as distinct from those mentioned as manufacturers of intermediates, both concerns claiming to have new methods which are different from the methods used by the older manufacturers in their production. One of them is the Pearsite Company, mentioned before, and the other is the American Co-operative Dye & Chemical Co., Bangor, Pa., who claim to have a new method for making a hosiery black, and some other colors of similar nature, and which is now in the course of formation. These two companies, however, are not known to the trade as manufacturers of colors, and the success of their new methods is therefore more or less problematical, and the future only will show whether or not they will be successful in their lines.

ANILINE OIL—Until about three years before the war, this very important product for the manufacture of aniline colors, and for producing blacks directly through oxidation in dye houses, was not made in the United States, and was furnished almost exclusively by Germany and England, being in the hands of a convention which controlled the price and conditions. About four years ago the manufacture of this product was commenced on a fairly large scale by the Benzole Products Company, now at Marcus Hook, Pa., whose sales agents are the General Chemical Company, who began with a production of about 1,000 tons, the whole annual consumption of the country at that time, by the way, being about 4,000 tons. This Benzole Products Company did not make much progress financially, owing to the fact that even when a tariff of 10 per cent was placed on this product, the foreign convention immediately reduced their price accordingly, that is, assumed this duty and still sold to their consumers here at the regular prices, and such prices did not leave the Benzole Company any profit, for they could not manufacture as cheaply as the Europeans were willing to sell for. At the beginning of the war, however, the imports from Europe stopped suddenly, and the demand for aniline oil became very acute. The Benzole Company immediately took the situation in hand and arranged to increase their production as quickly as possible, and have recently completed their new factory, so that they have increased their production very materially, and eventually will reach about 5,000 tons, which will be more than the entire consumption of the country under normal conditions, although the consumption will be increased very largely by the probable development in the manufacture of aniline colors, which is the largest use.

This is the concern I have mentioned as having been so fair in making contracts with their customers, that those who have bought from them have not had to pay the exorbitant prices asked by outsiders, and it is to their great credit therefore, for working directly for the benefit of American consumers, without the possible abnormal profit which they might have secured had they wished to take a different position.

In addition to the Benzole Products Company, there have a number of firms started up since the war to manufacture aniline oil, and some of these new factories have already started to deliver, but even at that the total production is not yet large enough to supply the demand. But the point is that in the end enough aniline oil will be manufactured in America to supply the demands of all consumers, so that if properly protected by tariff it will make this country independent of Europe for its supply of this product.

BENZOLE—This is the basis product for the manufacture of aniline colors and products, being used, however, largely for other purposes as well as for explosives. Before the present war, the normal production in the United States was about three million gallons. Since the war, owing to its suddenly increased demand, many steel companies and other similar industries who could recover benzole from their other operations, immediately began to do so, so that now it is estimated that the production of benzole for 1916 will be upwards of fifteen million gallons, or about five times the original production. Owing to the enormous demand for it from explosive manufacturers, and for export to other countries, the supply in this country, in spite of the increase, remains insufficient, and very high prices are asked. But the important point is that this large production is now assured, and whenever the foreign demand ceases and the demand for explosives ceases, the United States will have ample production of benzole from which to build up her other industries which depend upon it; for instance the manufacture of aniline colors and other similar products, and inevitably in view of the large supply the prices should not be any higher than those paid by foreign manufacturers for the same product.

CARBOLIC ACID—This is an article which has a large consumption in the United States, some eight to ten million pounds per annum, but which before the war was not manufactured here to any extent because American manufacturers could not compete with the German and English. Since the war, however, many plants have been put in and practically all that is consumed here at present is manufactured in this country, Thomas A. Edison alone, who was an enormous buyer before the war, now manufacturing 12,000 pounds daily according to his interview given in the *Journal of Commerce* of July 30th, most of which, however, he requires in his own works, and does not have much for resale. Other manufacturers are making it mostly for the making of picric acid for export, but after this demand for picric is over, then the manufacturers of carbolic acid will continue here in large quantities for domestic consumption, and the country should then be independent of Europe for its supply. This is another article which is also used in the manufacture of aniline colors, and will help their development.

INDIGO—There is now being built in Charleston, W. Va., a factory for the ostensible purpose of manufacturing caustic soda and chlorine products. It is, however, being built and controlled by a firm who are agents for one of the largest indigo manufacturers in Europe, and who, I am informed, have all arrangements made to make indigo if it can be done successfuly here, which it can in every way, except possibly not as cheaply as in Europe. With a proper protective tariff, however, this plant could be fully completed for the manufacture of indigo, and surely it would be a great relief to American consumers who use about one million and a quarter dollars' worth annually, to have a plant in this country from which they could draw their supplies, and be assured of them in the future.

INTERMEDIATE PRODUCTS—These products were practically all imported from Europe prior to the war, but since the war factories have been started for their manufacture, so are now produced in this country such articles as beta naphthol, paranitranilin, diphenylamin, dimethyl-anilin, H.-acid, benzidin, chlor-benzole, and some others, with more to come, all of which being used particularly by the aniline color manufacturers, although incidentally in some other lines. So again, if these new factories are protected by sufficient tariff, the manufacture will go on successfully, and we will again be independent of Europe for our supplies.

NAPHTHALINE—This is another coal tar product which has increased very largely by reason of the present conditions. Before the war the production in this country was about two and a half million pounds, while now it has increased to something like seven million, perhaps more; the normal consumption being about nine million pounds, and the difference between what was produced in America and the total was obtained from England and Germany, which hereafter they should be practically unable to ship over here by reason of the new large production here, and which should be sold in normal times at as low prices as could be sold by Germany and England. This is also a very important intermediate product for the manufacture of aniline colors, and again a help in this production.

SULPHUR BLACK—This is a color used largely for hosiery and cotton purposes, and which never before was manufactured successfuly in this country, or rather could not be manufactured cheaply enough to compete with European products. The probable consumption of it is four or five million pounds annually. Since the war our own concern have taken up the manufacture of this color successfully, and are now furnishing the goods to consumers, and are rapidly increasing our production so that we will probably produce two million pounds over 1916, all of which is practically sold on contract. Two other manufacturers have also taken up its manufacture, and are making contracts over the same period, so that it is probable that in 1916 the total amount of sulphur black manufactured in the United States will equal the former import from Europe, and with a proper protection in the tariff this large volume of business could be retained in the United States against all foreign competition.

You will see from the above that there is something actually being done in the United States in the development of coal tar and allied products, and no matter what happens in the future a large increase in this production will be assured, but I must repeat once more that if it is to be developed to the extent of supplying the whole amount of dyestuffs needed in the country which have heretofore been imported, it must have help from the Government in the way of an increased tariff, and the help of every consumer should therefore be given to bring about this very desirable result.

I wish to impress upon you in connection with the above list of what has been done, that on many of the products we are already producing in this country the normal consumption of the country, and this production will be kept up if properly protected. A notable exception to this statement, however, is aniline colors, which are so badly needed, but which owing to their variety and the complicated formulæ and range of raw material necessary to make them, as well as the large amount of capital necessary to manufacture them in a large way, have not been developed to the full quantity needed, but even with these disadvantages, my remarks show that all of the five factories mentioned are making every preparation for development to the best of their ability, and I believe in spite of the difficulties against them, that by January 1st, 1916, when they will all commence to get the benefit of their new installation and increase, they will be producing anywhere from three to four times their former production, which is a very important increase in itself. I make bold to say further that if these factories were assured of protection, they would increase their productions still further and to such an extent that within a year they could furnish the entire amount of color required by American consumers, and so relieve them once and for all of their dependence upon European manufacturers. When I make this statement, I do not mean that they can make every color which has been imported in so short a time, as there are a number of specialties which have some particular advantages in application, fastness, or something of that sort, and require a special raw material, which they would not be able to take up so quickly, and again there are a few colors which are still patented. But what I do mean to say is that they could make the colors necessary to furnish consumers every quantity and every shade which might be required, that is, give them something which they could use in place

What American Manufacturers Can Do.

of the specialties already mentioned, the latter being what we might call luxuries and dispensable until such time as they could again be resurrected, or again imported from Europe, as there can be no question but that some colors would probably always be imported no matter what the American manufacturers are able to do.

Such an assurance of protection would also probably mean the establishment of branch factories in this country of the European factories, as they would not want to lose their business over here, but the establishment over here of such factories would be welcomed by American factories, because they would then have to work under the same conditions that we do, and would not have any advantage in the cost of manufacture. Again, this assurance of protection would probably stimulate the starting of new American companies who would then be willing to advance the capital necessary, and take a chance of being successful. So that even if the five original factories mentioned could not live up to the statements I have made as to their ability, they would undoubtedly have lots of new help, and the result would be ultimately the same, viz., the manufacturing in this country of all colors which are needed for its consumption.

A New Suggestion for the Government to Consider.

In closing, I might say, however, that there is one thing which might be done in lieu of an increased tariff protection and which has been suggested before in different forms, but which is so reasonable and simple that I do not suppose it will be considered by our political leaders and parties, and that is, the establishment by the United States of a factory or factories for the manufacture of the intermediate coal tar products needed by the color manufacturers, and an arrangement to sell same to them at the same prices which are paid by the German manufacturers even though there might be no profit or even a possible loss to the Government in doing so. In addition to this great relief to American color makers, the Government, however, would have the greater purpose in mind of having plants already established capable of manufacturing ammunition in case of war; the point being that the raw materials used by color makers are very much the same as those used in the manufacture of various kinds of ammunition and explosives, and certainly such a factory or series of factories would be a very valuable asset for the Government. I believe it is true that other governments take an interest in and control to some extent their natural resources, for instance Germany is interested in her potash and coal fields, Japan in her production of camphor and menthol, and other governments in other products, therefore it is not out of reason that the United States Government should take a parental interest in its great benzole production, and the use of same for such purposes as the manufacture of aniline dyes for its American consumers, and the manufacture of explosives for its own protection should it become necessary. Certainly such a matter is well worth considering by our Administration, if it is impossible to secure added tariff protection on the lines mentioned so many times in this address.

I thank you for your attention.

The Status of the Chemical Industries in the United States at the End of 1915

Address Before the American Chemical Society, New York Section, October 8th, 1915.

I. F. STONE

MR. CHAIRMAN AND GENTLEMEN:

When your chairman asked me to address you on the status of the chemical industries in the United States at the end of 1915, I considered the subject with much trepidation, and felt that if I tried to speak on this subject I would be falling into a teeming cauldron of trouble, as with conditions so abnormal as they are today, any one trying to describe these conditions as they are, and as they may be for the next year or more, is very likely to prove a false prophet. But notwithstanding these conditions, I will do the best I can, and hope anything I may have to say will be of interest to you.

Right after the beginning of the war there was an immediate demand from all sides for products which had formerly been supplied from Europe, which were apt to be scarce as a result of the war, buyers attempting to secure as large supplies as possible in order to carry them through during this war, might it be long or short, and as a result the prices of European products immediately commenced to advance and finally reached the most fabulous figures. Those of us connected with the lines of business dealing in these products, then thought that no more abnormal and exciting condition could be possible. But strange enough, now, a year after the war, conditions are more exciting than ever, in that most of the European products which were then procurable in some quantity have practically disappeared, while the demand for them still continues to a great extent, but is impossible to meet.

The products manufactured in America, not dependent entirely on Europe, did not follow immediately the advance of the European products, but gradually, as the manufacturers commenced to see how things were developing and what their cost of raw material would likely be in the near future, they advanced their prices until they are now many times the normal in a good many instances.

American manufacturers also began to consider the question of manufacturing larger quantities of what they were already making, and also taking up new products which formerly could only be obtained from Europe, and I am glad to say that a great deal of progress has been made along these lines. I can say definitely that the chemical industries in the United States at this time are developing rapidly, and are in a stronger and better condition at this time, the end of 1915, than ever in the past, and many of the products which are now being manufactured will, in my opinion, continue to be manufactured after normal conditions are again in vogue, and we need no longer be dependent on Europe for such products. I will be more specific as I go along, but simply wanted to mention the fact at this time that the condition and progress of the chemical industries had developed and are now in a stronger position than ever before.

At the time of the war, or just before the war, the two most important chemical products furnished by Europe to the United States, in this case by Germany, were potash and coal tar products. We were entirely dependent on Germany for muriate and sulphate of potash, which as you know are used very largely for fertilizers, and in a smaller way for the manufacture of potash products such as bichromate of potash, yellow prussiate of potash, caustic potash, and so on, the manufacture of which was dependent on Germany for their supply of raw material. Unfortunately, since the war and the embargo on the shipment of potash to the United States, none now being reecived, no substitute has been found, and in spite of the reports from the Department of Commerce that large quantities could be secured from a seaweed called kelp, which is in beds or meadows along the Pacific Coast, belonging to this Government, nothing so far has been practically done to recover it. There are reputed deposits of potash in Utah and California, but again nothing practical has ever been done with them, so that at the present time consumers of potash or potash products are entirely dependent on what is left of the German shipments before and right after the war, and when these stocks are exhausted, no one knows what can be done.

On the other hand, on coal tar products, it was immediately discovered by investigation in this country that we had large quantities available if they only could be recovered and developed. In other words, the production of benzole, which is the principal base for the manufacture of most coal tar products and chemicals, could be immediately increased, and this was and is being done. Some of the large steel works, who formerly did not recover their benzole, are now producing it, and the production, which was about 3,000,000 gallons before the war, is now increased to about 15,000,000 gallons, and while unfortunately its demand for war purposes in the manufacture of explosives, etc., is so great that even the present supply is not sufficient, and prices are almost too high for manufacturers to use it for the manufacture of ordinary products not connected with war products, yet the fact remains that this product has increased in production over five times, and this production is here to stay, and at normal prices will be largely used for the manufacture of other products, which will develop with it. There is one use for benzole, for instance, which is practical and sure, and that is its use for motive purposes in automobiles in place of gasoline. It is being largely used in Europe for this purpose, and the only reason it has not been used here has been the limited production and the higher price, it normally being about double the cost of gasoline. With the present immense production, however, the cost has been reduced until now I believe that it can be manufactured and sold at a profit at the proportionate price of gasoline, and that this will be done as soon as the present war is over. When I say proportionate price I mean that careful experiments for automobile purposes show that benzole has a motive power about 25 per cent better than gasoline, consequently would have 25 per cent advantage at the same price, so that even with benzole 25 per cent more in cost it would still be money value, but I also really believe that it could be actually produced now and sold at the same price as gasoline if it were necessary to do so. Therefore the importance of this matter is obvious. Not only is the above true, but it is a fact that the use of gasoline for automobile purposes is so large that it is very difficult for the oil companies to produce enough to meet the demand, consequently the entrance of the new product for the same purpose will be very important, and a great relief.

Another large increase in production through the present conditions is the manufacture of aniline colors and other coal tar products in this country, which will be much to the relief of consumers who at the present time are unable to get anything like the supply of colors which they need in the conduct of their business. The five factories already established in this country before the war are all extending their production to their utmost capacity in keeping with safety for their investment, and I believe that in 1916 the production of aniline colors in this country will be at least three to four times the production before the war. This production could again be largely increased if the manufacturers were sure of some protection from the Government in the way of higher tariff, or Government manufacture of intermediate materials, which would enable them to get same at the same price as paid by European manufacturers; and then again the putting into effect some anti-dumping clause which is now promised by the Government, to prevent the dumping into this country of colors at lower prices than they are sold elsewhere, for the purpose of preventing their development and manufacture here. Whatever the Government may finally decide to do towards the protection of this industry, there remains the fact that a great impetus in the development is already under way, with the hope of Government protection, so that the Europeans will find them strongly entrenched in any event after the close of the war. I am speaking now of the factories already in operation, but in addition to those there are many new factories projected, and some in operation. I have a list of twenty-three new factories, the last of them with a proposed capital of $15,000,000, and while a good many of these may not materialize, something will surely come of some of them. Up to now none have actually manufactured any aniline colors, but some are operating with a production of some intermediate products like aniline oil, beta naphthol, paranitranilin, etc., and, speaking of aniline oil, with the one factory established before the war and the increase in its works since the war, and the number of new factories making or about to make aniline oil, it looks as if the production of this product would be 8,000 to 10,000 tons as against the normal consumption of about 4,000 tons; in other words, the proposed manufacture seems larger than the consumption, but as the consumption is also increased, possibly the whole amount projected can be used. At any rate there will be enough manufactured in this country to take care of the whole consumption, so that Europe need not be depended upon.

Another article which has increased largely in production is carbolic acid, the consumption of which in the United States is about eight to ten million pounds yearly. It is true, however, that this has not been aavilable for ordinary use, as most of the new factories have used their product for the manufacture of picric acid, which is sold for war purposes, with the exception, perhaps, of the works of Thos. A. Edison, who, in an interview, said that his production was about 12,000 pounds daily, which is used for his records. The point about this article is that practically none of it was manufactured here prior to the war, but it is now produced in large quantities, and after the demand for picric acid is over, for war purposes, then the production can be used for other commercial purposes to the advantage of the country, and so relieve them of depending on Europe for their supply.

Another article which has increased largely in production here is naphthaline, which is also a coal tar product. Before the war the production in this country was about 2½ million pounds, while now it has increased to something like 7,000,000, perhaps more, the normal consumption being about 9,000,000, and the difference between what was produced in America and the total was obtained from England and Germany, which countries hereafter should be practically unable to ship over here, by reason of the new large production here.

This is about all I will say in connection with aniline or coal tar products, but as it is obvious that there is a great development taking place in this industry, it is certainly a very satisfactory condition at this time. Now, to leave the aniline industry, and go to other products not connected with aniline, but the development of which has gone on very quickly since the war, I will refer first to barytes and barium products. Before the war there had been a yearly average importation to this country of crude barytes of about 40,000 tons coming from Germany, practically all of which was used in the manufacture of lithophone, which was about the only product of barytes made largely in this country prior to the war. There are now six manufacturers who are turning out large quantities, and the business on this product will remain with the American factories. I wish to say, however, that since the beginning of the war no barytes has been coming in from Germany but it has been supplied from mines and deposits in the States of Tennessee, Kentucky, Virginia and Missouri, and possibly some others, and now the thing to do is to continue to use this American product and keep away from the European barytes. Formerly there was a duty of $1.50 per ton on foreign barytes, but this was reduced in the last tariff to 15 per cent, which was only about half. The German barytes was formerly delivered at a cost of about $5 per ton at such ports as Philadelphia and New York, the duty of 15 per cent per ton included, and the American barytes under normal conditions could not compete and can only sell now because no German goods can be secured.

The German barytes tests higher in barium sulphate content, averaging about 96 per cent and almost free from objectionable impurities, and the consumer obtains a better yield at a lower cost than by the use of the available American barytes, which only analyzes from about 83/95 per cent barium sulphate, averaging say 92 per cent and much of which is contaminated with iron. The point is, then, that a duty should be placed on foreign barytes high enough to offset the difference in quality and price, and insure the continued use of American barytes by American manufacturers. In other words, the duty should be advanced, instead of standing at the present duty of 15 per cent per ton. In addition to using the American barytes for the manufacture of lithophone, since the war four or five responsible factories have started up to manufacture other barium products such as chloride of barium, carbonate of barium, hydrate of barium, nitrate of barium, and binoxide of barium, which means an increased use of the crude barytes, giving still further production to American producers, possibly double the quantity formerly used, and it is important that American producers should continue to furnish the crude barytes to these factories in spite of the German competition, which is bound to come again after the war, and as far as I know an additional duty is the only way it can be done. With the manufacture in this country of the products just mentioned, viz., chloride of barium, carbonate of barium, hydrate of barium, nitrate of barium and binoxide of barium, most of which were never made in this country before successfully, we have a practically new industry created, which will make us independent of Europe in the future, some of these factories being already in operation successfully, and the full production of all of them will undoubtedly be on the market before very long. This makes the barytes and barytes products in this country practically a new industry and one which could be held in the future, and is of great importance.

Another product, the manufacture of which has increased largely in this country since the war, is carbon tetrachloride, which was formerly made exclusively in Germany, but later taken up by American manufacturers, who at the time the war began were probably producing half the consumption here. Since the war they have increased their plants very largely so that they are now supplying all of the American trade, and while still somewhat short of the requirements, new factories are being constructed so that in the end the whole consumption of the country will be manufactured here. This article is perhaps not so well known, but is one of considerable importance, and the consumption is continually increasing in view of the many purposes for which it can be used.

I have given up to now the situation on such articles for which we formerly depended largely on Europe, but the manufacture of which has increased largely in this country, which gives a distinct advantage and increase in our chemical industry. I will therefore now refer to a number of products which have always been produced largely in this country, and not so susceptible to European competition, simply to advise you the condition of the manufacture of these articles and the present and future conditions regarding them.

First in importance, I presume, is the manufacture of such acids as sulphuric acid, nitric acid and muriatic acid, which are the basic materials for practically all of the great chemical industries of the country, and on which there has never been any foreign competition because largely of the heavy expense of transportation, and the fact that American manufacturers were able to make such prices as to render the importation unprofitable. Up to within a few months ago they were able to supply the demand of the country as usual, but as the war ran on, and the demand for ammunition and explosive purposes became larger and larger, the demand for acids increased to such an extent that at this time the manufacturers are absolutely unable to supply it, and as a consequence American consumers find themselves unable to get enough to conduct their business, or, when they do get enough for their present business, are unable to obtain any additional quantities for an increased business, so that the general situation on acids is very serious at this time. Many increases are planned and under construction, but it will be a number of months before they can be completed, and not much relief is looked for for some time to come.

Perhaps the next important manufactures in volume and value are caustic soda, soda ash and bleaching powder, all of which are now manufactured largely in this country, the quantity I am told being from 1,250,000 to 1,400,000 tons of the three products together. For a short time after the war, the manufacturers were able to continue their supply in their ordinary way, but the stopping of shipments from European countries to other countries by reason of the war led to a demand for American manufactures to supply the shortage, that is, countries who had formerly bought from England and Germany and who could not get any from Germany at all and not enough from England, turned to America for their supply, and this created a large export business which brought the manufacturers to their full production and has kept them very busy up to this time. By reason of this unusual export demand, and the consequent shortening of stock, the condition of these products means great prosperity to the American manufacturers.

Other products manufactured largely in this country are such products as yellow prussiate soda and potash, chlorate of soda and potash, bichromate of soda and potash, the manufacturers of which hold the whole American trade, as there are practically no importations from Europe. The manufacture of yellow prussiate potash, however, is somewhat limited owing to the inability of manufacturers to get muriate of potash from Germany, so most of them are working almost exclusively on soda, and the paint manufacturers, who are large users, are now trying to make their Prussian blues from soda instead of potash, and if successful, as some of them seem to be, the soda will probably be used exclusively for a long time to come, and there will be no need to depend on European sources for potash.

The manufacture of chlorate soda and bichromate soda continues without hindrance, and in increasing quantities, but chlorate potash and bichromate potash are apt to be somewhat limited owing again to their inability to get proper quantities of the muriate potash, these manufacturers depending, as far as I can find out, on muriate potash which was brought in from Germany before or just after the war, and while they are fortunate in having enough to go on with their manufacturing, it must be evident that sooner or later their potash products must stop, and soda products substituted wherever possible.

The condition of another potash product is also interesting, speaking now of caustic potash, the manufacture of which was commenced in this country some years ago and up to the time of the war was constantly gaining in importance and production. Unfortunately, however, the manufacturers were dependent entirely on Germany for their muriate potash, and when shipments of this were stopped the factory was compelled to slow up, and is now in a position where they can only make such a quantity of caustic potash for which they can secure the raw material. Should the muriate potash be found or produced in America, then this caustic potash could be made largely, but while depending on Germany muriate potash must necessarily continue to be limited.

Another important article the manufacture of which has developed in this country is oxalic acid. The factory established some years ago, but up to the time of the war, having trouble to compete with European product on account of the reduction of duty in the last tariff, was not liable to develop the production as they wished, but since the war, and the importation of foreign acid practically stopped, they have taken care of practically the whole American consumption, and will continue to do so to the limit of their ability. They are not yet able to produce the full quantity, so there is a considerable shortage in supplies, consequently the price is very high, but eventually there is no reason why this product should not be manufactured to the full extent of the American consumption, and the business held here.

There are many other chemical products which are manufactured in this country, but not of enough importance to enumerate separately, so all I can say in finishing is that the status of the chemical industries in the United States at this time is very satisfactory, practically every manufacturer being engaged to the limit of his capacity, and from every indication this prosperity will continue for the following year, for the reason that most of them have made contracts covering their production for this period.

You will notice in speaking of these various products manufactured in America, I have made frequent reference to tariff, and the necessity of advancing the duty if articles manufactured are to be developed successfully, and while I have no intention of making this an address on tariff, at this time, it is so obvious that the tariff should be reformed upward to retain the present manufacturers successfully, that I cannot help mentioning it.

I hope what I have said this evening will be of interest to you, and thank you for your attention.

The Aniline Industry from a Manufacturer's Viewpoint

Address Before Meeting of Society of Chemical Industry

Chemists' Club, October 22nd, 1915

J. F. SCHOELLKOPF

Of all industrially prominent countries the United States is, doubtless, the one which has been most successful in the manufacture of products of universal use. For articles of this class the large home market, cheap transportation, and great consuming capacity of the American people, permit the construction of manufacturing plants on an enormous scale, where machinery takes the place of hand labor, so that in spite of high wages, the actual labor cost of such articles is frequently less than that of the same articles when produced in countries with a more limited consumption. At the last revision of the tariff, the Steel Corporation stated that they had no objection to a lowering of the duty on their products; the automobile industry, which manufactures on a scale unheard of in any other country, even before the present war, was exporting its products to every corner of the globe; other articles in point are agricultural machinery, sewing machines, typewriters, leather, boots and shoes, and to mention a few chemical products, wood alcohol, acetate of lime, caustic soda, etc.

Unfortunately, the manufacture of synthetic dyestuffs does not lend itself to such mass production. The estimated annual consumption in the United States is about 40,000,000 pounds of an approximate sales value of $15,000,000. While this amount is quite large when considered by itself, it is small when compared with the products enumerated above, and from the manufacturer's viewpoint dwindles to small proportions indeed.

According to Schultz and Julius' Tables, 1914, there were on the market at that time not less than 930 synthetic dyestuffs, being chemical individuals, not mixtures, or 1,000 in round figures, as there are a number, the constitution of which the color factories refuse to divulge. Assuming that the American trade demands all of the 1,000 products now on the market, this would necessitate, so to speak, 1,000 individual miniature factories, each having a capacity of about 40,000 pounds. This, of course, would not actually be the case, for among all colors used there are a dozen or so which constitute about 75 per cent of this country's consumption, including such colors as sulphur black, direct black, acid black, chrome black, nigrosine, indigo, auramine, benzopurpurin, patent blue, paper blue, alizarin, fuchsine, and phosphine. Assuming this to be approximately correct, that would leave 10,000,000 pounds for the remaining 988 dyestuffs, or an average of about 10,000 pounds for every little factory. It is obvious that to produce so small a quantity, the manufacturer could not run his factory the whole year round, and he is compelled, therefore, to manufacture a number of different colors in the same installation in succession, each change necessitating extra labor in clearing and altering the apparatus. The monster European factories, having a very much larger production, do not suffer from this disadvantage to nearly the same extent.

Their larger output of individual colors is also an advantage in other respects. According to their latest report, the Farbwerke Hoechst had in their employ more than 300 chemists. Allowing one hundred of that number for their inorganic, analytical and research work, that would leave two hundred to look after the manufacture of about 500 colors, as the concern mentioned probably does not make more than 500 of the dyestuffs mentioned in Schultz's Tables. One chemist, therefore, has on the average no more than two or three colors in his direct charge, and this continuously during the whole year.

Every chemist who has had actual manufacturing experience will realize that only by being in daily contact with the product of his manufacture can he attain that efficiency which enables him to detect at once the slightest inaccuracy in his processes, and to turn out a product always uniform in quality and yield. On the other hand, when called upon to change from one product to another every few months, as is the rule in American color factories, slight details in the processes may have escaped his mind or other conditions may have changed, causing loss in yield and increasing generally the cost of production.

Corresponding to the variety of processes that are carried out in a dyestuff factory, a great variety as well as a great quantity of chemicals, inorganic as well as organic, are used. Almost all of these can be obtained in this country in normal times in sufficient quantities and at fair prices.

A very important part in our industry is played by the so-called intermediate products, most of which have been imported from Europe, principally Germany, and I must confess that at recent tariff revisions I have sought to have these placed on the free list. This has, doubtless, created the impression in some quarters that the manufacture of these products was particularly complicated and difficult. Nothing, however, is further from the truth. Many of our most important intermediates, such as nitrobenzene, aniline, α- and β-naphthylamine, β-naphthol, metanilic acid, sulphanilic acid, naphthionic acid, benzidine, are made by simple processes. In fact, before the war, and while these intermediates were on the free list, we have found it cheaper to manufacture several of them in our own works rather than import them, duty free, from abroad. However, in other cases, some of these derivatives consume such large quantities of chemicals, mostly mineral acids, which in part cannot be obtained at all, or partly at a materially higher price than in Germany, and furthermore the yield is comparatively small, so that we had to import those materials.

Even the large German factories do not manufacture all of their own intermediates; some of them constitute only a very small part of a given dyestuff, and I am sure can only be made successfully by factories that specialize in them, and do not entirely depend on their own consumption.

In a recent issue of the *Daily Trade Record,* Dr. Norton states that an American company has for some time been manufacturing aniline oil on a large scale and supplying it to New England textile works for use in the production of aniline black. It is now engaged in putting up small aniline plants for the use of textile houses and dye houses where there is an extensive application of aniline black; these plants are put up at a cost of $1,000 and require the attention of a single skilled laborer for operation. It is found that, in practice, the aniline produced in these small plants, at the current rate of benzol, costs about 30 cents per pound.

We are seriously considering the advisability of following this example and putting on the market a small aniline color plant, which with a few skilled men will enable every textile mill to produce its own color.

Since the process of making dyestuffs is in no two cases exactly the same, a large variety of complicated machinery is required. Following is a partial list of apparatus which is installed in our works, and we manufacture only about 136 out of a possible 1,000 dyestuffs: Boilers, steam engines, steam pumps, vacuum pumps, rotary pumps, air compressors, ice machines, electric motors, filter presses, wash presses, suction filters, presses for recovery of volatile substances, plain stills, vacuum stills, pressure tanks, autoclaves, nitrating and sulphonating kettles, centrifuges, shelf driers, vacuum driers, kiln driers, incinerators, rotary driers, drum driers, evaporating pans, ball mills, disc mills, mixers of every description, vats of all sizes, tanks, and a lot of special apparatus which is designed for every individual case by our own engineers.

Another peculiar feature of the dyestuff industry is the fact that it is subject, to a great extent, to changes in style, more so if it depends only on the home market. It is thus confronted with the falling off of sales of certain shades, while others enjoy a particular boom, necessitating a constant shifting of manufacturing and a correspondingly great flexibility of apparatus.

From what has been said, it will be seen what an important position falls to the engineering force of a color factory. The Badische factory in Ludwigshafen alone is said to employ over two hundred engineers with college training.

We must not forget that Germany is by far in the lead, and there are a number of colors which German manufacturers have patented in this country, which consequently are beyond competition, but the inventions in this line, of the last few years, have had by no means the revolutionizing effect of the older inventions like the ponceaus, which replaced cochineal; of alizarin, which replaced madder; of indigo, which put the natural product out of business, or of acid and direct blacks, which compete successfully with logwood. In spite of these latest inventions, however, the consumption of the older colors seems to increase steadily. I also doubt if there is any great invention to be expected which would interfere materially with the older colors. This does not mean that research in the hope of discovering new products should be abandoned altogether. With due co-operation between universities and industry, as has been the case in Germany for many years and to which is due, to a large extent, the greatness of the German dyestuff industry, there are many promising problems yet to be solved, but just as much, or perhaps more, has been accomplished by working in the older field, in consequence of which our industry has been able to lower prices from year to year in contrast with almost all other industries, which in proportion to the rise in wages have had to raise their prices if they did not choose to lower the standard of their goods instead.

Viewed from a manufacturer's standpoint, the present condition of the aniline color industry in America is a most trying one, owing to the difficulty in securing adequate supplies of all kinds, even the ordinary heavy chemicals, such as sulphuric and nitric acids.

In conclusion, I may summarize the needs of the industry after we return to normal conditions: We shall require, first, a plentiful supply of all chemicals, including so-called heavy chemicals. All of these will, doubtless, be obtainable from American sources. Second, all basic raw materials derived from coal tar in practically chemically pure form. Some of them are obtainable now; in fact, the war has greatly stimulated the manufacture of a number of these products, unfortunately mostly for use in explosives. But, as the manufacturers are reaping enormous profits on these products during the war, they will be able to write off their plants and after the war should be in a position to furnish an ample supply of these chemicals for color purposes.

Thirdly, we need intermediates. Very few of these are made at the present time in this country for reasons I have outlined before. But even the many that are missing present no serious problem from the manufacturer's viewpoint, always keeping in mind the fact that a way must be found to offset the higher manufacturing costs. In frequent conferences with large chemical concerns intending to take up the manufacture of intermediates, we usually found no willingness to enter into their manufacture if we could not guarantee to take, say, over fifty tons or so annually of each product.

Fourthly, we need the co-operation of the American consumers, which, I regret to say, was extended to us in the past only to a very limited extent. I believe, however, the war has taught them a lesson which the present generation will hardly forget.

Fifthly, and most important of all, we need legislation which will help to create the industry by first creating conditions that will make it profitable, since every manufacturer is entitled to a reasonable return on his investment.

If these conditions are fulfilled, I venture to say that American mills will soon be using "American aniline colors," and any possible slight increase in cost will be more than offset by the assurance that they will be protected absolutely against any future recurrence of the present calamitous situation.

The Present and Future of the Dyestuff Situation in the United States

Being an Article Written for "Cotton," Appearing in Issue of September, 1916

I. F. STONE

I. F. Stone, president of the National Aniline & Chemical Company, of New York, in speaking of the present situation of dyestuffs in this country, said: "It will, perhaps, be interesting to start by comparing this situation with the situation one year ago.

"At this time last year, 1915, practically no shipments had been received from Germany or other European countries since early in the spring, and American agents for these factories were practically sold out of their stocks. No American factory had had time to increase its production by the erection of new buildings, etc., therefore the situation became very strenuous, and it was practically impossible to secure a sufficient supply of any color. Prices naturally advanced to almost prohibitive figures, that is, the consumers or dealers who had a stock of colors would only sell them because of the extremely high price they might get; one color, for instance (sulphur black), being sold in considerable quantities at as high as $3 per pound as compared with a normal price of about 20 cents per pound.

"In discussing the beginning of the clearing up of the situation, as far as supplies are concerned, I am compelled to speak particularly, and without prejudice to other factories, of our works, the Schoellkopf Aniline & Chemical Works, Inc., for whom the National Aniline & Chemical Company are selling agents, as they were the first to begin to relieve the situation. This factory was established in 1879 by two brothers, J. F. Schoellkopf and C. P. Hugo Schoellkopf, and has been run continuously since that time by these gentlemen. They, therefore, have the benefit of some thirty-six years of continued experience in the manufacture of aniline products, and as a consequence our factory is the oldest and largest of the American factories.

"Our factory was making, in addition to those colors which were made by other American factories, a good line of direct cotton colors, which were very much in demand. On direct black, for instance, we had a possible production of about one-quarter of the estimated annual consumption; the other three-quarters being furnished by German and other European factories. Our production was immediately available for consumption, and did a great deal to relieve the situation as far as direct black was concerned. This was also true of other colors, although the quantities were not so large. It was our opinion that the war would extend over a considerable period of time, and we therefore made arrangements to increase production largely, as soon as possible. By the end of the year we had new factories in operation, which gave us a large increase over our ordinary production, and for this increased production we made contracts over this year, 1916, and consumers who made such contracts have been taken care of practically to the full extent of their contracts. Our increase for one color alone, for instance, the direct black already spoken of, was about four times the original production for this year and other colors in proportion. In addition to being a direct dyeing color for cotton, and mixed goods, it was found that by treating it with formaldehyde solution, it made a nice fast black on hosiery, and therefore replaced very satisfactorily the developed and other aniline blacks formerly used for this purpose.

"Fortunately it happened that our Dr. J. F. Schoellkopf, Jr., who had finished his education in German universities, and given particular attention to the chemical industry, had been working on sulphur blacks and has been so successful that about November 1st, 1915, we were producing and delivering to consumers considerable quantities of this color. Thus we were the first, and are now the largest producers of this color in America

"This sulphur black together with the direct black already mentioned, were of particular benefit to cotton and hosiery mills, where they were largely used, and those who had contracts with us have been able to run full this year on material on which they used these colors.

"Being an American industry, it was our policy to place contracts for raw and intermediate materials, as far as we could, with other American factories, even though we paid a higher price than we could have secured from Europe. The fortunate result of this policy was that after the war commenced and the importation of aniline oil and other intermediate products stopped, we continued to have our regular supply and were consequently able to produce our regular quantities of the colors which we made from these American intermediate products, and being, I think, the only factory who had placed its contracts with American factories, were the only ones who were able to run regularly through the strenuous year of 1915. We could not, of course, increase our production until we had new buildings, new installations and increased quantities of raw materials, the factories making these materials having also arranged to increase their facilities in the meantime.

"We did, however, make one mistake in making our prices for 1916 contracts and that was we did not look forward to the enormous increase in the cost of raw material such as benzole and like products, which resulted to us in a far higher cost on our additional quantity of raw material than we had figured upon, consequently it increased our cost of production of colors much more than we expected. We have, however, filled all of our contracts at contract prices, without making any attempt to advance, but for 1917, in order to cover ourselves on this increased cost of raw material, new buildings, installations, etc., we were compelled to advance prices over the 1916 prices, so that by the end of the year we would have profit enough to cover the cost of the increase in raw materials, buildings, etc.

"The extent of the increase in production will be at once understood when I say that we will have spent in the near future several millions of dollars for this purpose, which in addition to the capital or money employed in our old factories, gives us a large investment and makes us compare favorably with some of the European factories in size and production.

"In addition to our own factory before the war, there were four other factories who made a limited line of aniline colors and these factories also largely extended their production and increased their facilities in much the same way as we have, although not, I think, on anything like so large a scale. Two of these factories, however, are controlled by German factories, one of them being owned outright by a large German factory and the other, since the war, having sold its control to the representative of another large German factory, so that the increase in production of these two factories is more or less restricted to such colors as will not compete with their German principals. Therefore the bulk of the trade is really in the hands of the three other factories who are entirely independent of foreign concerns, and are financed entirely by American capital and American facilities. These three factories, particularly, are doing the most to relieve and clear up the situation, and in 1917 will be able to produce enough staple colors to take care of the demand, if the consumers are careful enough to make contracts for their supplies at this time, so that these factories can be prepared with the necessary installations and raw materials to make the colors for which they accept contracts. Speaking for our own factory, we are willing to increase our facilities to practically any extent as long as consumers will support us by making contracts.

"The German factories in years gone by have made large amounts of money on their products, and as a consequence their factories have been charged off from these profits so that their capital stock as a rule does not represent more than one-quarter of the amount of capital employed in their operations, and this is one reason why they are able to pay the large dividends which they have been paying, viz., 20 to 30 per cent annually, even though in America particularly they cut the prices to almost no profit in order to prevent the increase in American production. This is now what the American factories are trying to do, viz., using all their profits for the erection of their new factories and if possible have them paid for by the end of the war and so be on the same basis as the German factories, and overcome this heretofore insurmountable advantage. Some of the German factories also have the advantage of a large profit on the manufacture of pharmaceutical products, which line has so far not been taken up by American factories, although it may be later on, and this is another reason why the Germans were able to make such low prices on colors; in other words, they made up in profits on pharmaceutical products what they did not make on colors.

"In saying as I have that the American factories will be able to take care of the whole demand of American consumers, I do not mean to say that they will make every color which has hitherto been furnished by European factories, but that they will make a staple line of colors which will enable any consumer to produce a line of shades to answer all reasonable requirements. For the colors which are not made in this country, what I might call the luxury colors, that is, colors not actually necessary but very useful, it is possible that the new submarine service which the Germans are trying to establish with submarine boats like the 'Deutschland' will be able to furnish this country with enough of such colors to provide the special shades and requirements which may not be furnished by American factories, but this is not so necessary as it is desirable, that is, it is not actually needed but would be very welcome in addition to those colors which are made here.

"I have spoken so far only of five factories which were actually in operation before the war, and which went through all of the intense competition with the European factories prior to that time, because I believe that these factories are entitled to the first support of American consumers, rather than the newer factories which have been started since the war. When the war is over, some of these newer factories will not be able to stand the competition which will naturally ensue.

"Aside from the manufacture of aniline and sulphur colors, there have been quite a number of new factories established for the manufacture of what we call intermediate products, such as aniline oil, beta naphthol, paranitranilin, etc., some of these manufacturers being very responsible and whose business will be continued in spite of European competition after the war is over, if conditions are favorable, that is if they have proper tariff protection and other Government support. This is particularly true of aniline oil, which is now manufactured largely here, and it is doubtful if it will ever again be imported in any important quantity.

"In my opinion, if the Senate will increase the protection on aniline products in the new tariff bill (H. R. 16763) recently passed by the House of Representatives, giving them in addition to the present 30 per cent ad valorem on aniline colors, 5 cents per pound specific duty, and in addition to the ad valorem duty of 15 per cent on intermediate and raw products, 2½ cents per pound specific duty to 7½ cents per pound specific duty on aniline colors and 3¾ cents per pound on intermediate products, in addition to the present ad valorem duty, these being the duties suggested by the committee appointed by the American Chemical Society, New York Section, in their report of November 6, 1914 (of which committee I was a member), after a most careful investigation of the situation, together with the anti-dumping clause which will prevent European manufacturers from selling their products here in this country at lower prices than they do at home in order to prevent the American production and also the increase in their production owing to the present war conditions—the American factories will, in the future, be in a position to compete with the European factories on more or less of an even basis, and the German monopoly of this business, so long enjoyed by them, will be restricted to special colors on which they have patents or some particular advantage in the manufacture which cannot be had here. The American manufacturers will be able therefore to hold the bulk of the trade on staple colors and products which they are now manufacturing.

"The result to American consumers will be very advantageous as they will then be able to buy their colors at a staple and more average uniform price than heretofore, as it has been the custom of the German factories to get high prices on such colors as could not be produced here, while on the colors which were produced here, or could be produced here, they made prices which were out of all reason in proportion to what they sold them for in other countries; in other words, they sold at much less in this country than they should have in order to prevent American competition. Their average price, however, figuring the special and staple colors together as a whole, will be in my opinion higher than the average price of American colors, so the manufacture in America will be a great advantage to the public in general.

"With regard to the present high prices for American products, I would say this is due entirely to the high cost of raw materials, starting with benzole and its derivatives and continuing through acids and other various chemicals used for the manufacture of colors and other finished products, the high cost being caused by their demand for explosives and other war purposes. As soon as the war demand is over, the large production, which has been continuously increased to answer this demand, will be available for commercial purposes, and conditions will then become more normal, and the prices will be reduced, and consequently the prices for colors and other aniline products made from them will be correspondingly reduced.

"The definite answer to your question, therefore, is that the present condition of dyestuffs supplies is very satisfactory, and the future outlook still more satisfactory in that everything indicates that a large business will be in the hands of American manufacturers instead of in the hands of European manufacturers as has been the case prior to the present war."

The Manufacture of Aniline Dyes in America

Address Before the National Silk Convention, at Paterson, New Jersey, November 23rd, 1916.

I. F. Stone

In speaking of this subject, and in order to properly compare the present situation with that of a year ago at this time, and previous to the war, I can say that just after the war, in 1914, the situation promised to be very acute, as it was evident that the shipping of colors from Europe would be stopped and there were not sufficient stocks in this country to take care of the consumers for any length of time. This proved to be very true, as, as early as January, 1915, there came a great scarcity of dyestuffs and prices commenced to advance to an almost unbelievable extent. The American manufacturers were hampered in producing any additional quantities by the fact that they were buying most of their raw and intermediate materials from Europe, and with the stoppage of the shipments of colors to this country the shipping of these raw materials and intermediates also stopped, therefore the American manufacturers were almost in as unsatisfactory condition as were the consumers, in their inability to get supplies of the raw materials.

1914

Raw Materials

For a period then, from the beginning of the war until about October, 1915, the situation was very acute, but in the meantime, fortunately, arrangements had been made to manufacture a number of the raw materials and intermediate products by the color manufacturers, so that by this time, viz., October, 1915, they were enabled to increase their manufacture to considerable extent. In our own factory, Schoellkopf Aniline & Chemical Works, we were particualrly fortunate in this respect, in that the contract for one of our principal raw materials (aniline oil) had been placed with an American manufacturer who had commenced the manufacture of this product a couple of years preceding the war, and whom it was our policy to encourage. This contract for aniline oil, together with our having our own acid plant for the manufacture of sulphuric, nitric, muriatic and other necessary acids, also together with a large stock of foreign raw materials which we always carried, enabled us not only to continue our regular production from the time the war started, but by the fall of 1915, viz., October, increased our production on many of our colors, particularly direct black, which was a very serviceable color for cotton and union goods, and cotton and silk hosiery.

Direct Black

We were also fortunate enough to be able to produce at practically the same time a very satisfactory quality and quantity of sulphur black, for cotton goods, in fact, as good a quality as had been previously imported, and this, with our direct black, was of great service in relieving the situation on these two products. Other manufacturers also at the same time commenced to get into better condition to make colors, and the situation, therefore, about October, 1915, was much easier than in the beginning of the year, although the production of all these factories, even then, was not enough to take care of the consumption.

Black Sulphur

1916

From that time on, however, large increases in the production of the already established factories, and the installment of a number of new factories, commenced to clear the situation so that at the present time the production of the American factories will be enough to take care of the whole consumption of aniline dyes in this country in the future, for all of what I might term staple colors, and the situation therefore at this time is very satisfactory.

In explaining the success of the American factories in reaching this position, I must first explain the conditions

Coal Tar

Anilin Oil

Benzole and Naphthaline

Intermediates

Colors

of raw material, coal tar, and its derivatives, and intermediate materials, which they use in their manufacture. Before the war there were practically no manufacturers of what we call intermediate products in this country, the only exception being aniline oil, of which I have spoken, and this had been only made to a limited extent and not profitably, by reason of foreign competition. The basic materials, however, benzole, napthaline, etc., from which practically all aniline colors are derived, were being produced in this country to quite a large extent; benzole for use as a solvent and for other purposes not connected with the manufacture of anilines, and naphthaline for a month destroyer, but upon the demand from the aniline manufacturers for there derivities, and for explosives and other war purposes, they immediately became utilized for these purposes, and American producers of benzole commenced to increase their production, and were so successful that at present there is a production of about thirty million gallons per annum, as against three millions gallons prior to the war, and the production of naphthaline was also largely increased, so that there is ample supply of these products at this time, and from them are now being manufactured largely such intermediates as aniline oil, beta naphthol, alpho-naphtylamine, paranitranilin, chlorbenzole, dimethylanilin, paraphenylenediamine, etc., so that the American manufacturers of colors are able to get sufficient raw materials to manufacture enough colors to supply the whole consumption, speaking now of a general line of colors but not of all of the colors which were formerly used, there being some specialties made by the European manufacturers which we have not yet commenced to manufacture, for reasons which are evident, such as not being able to secure the proper raw material, or not being able to do everything all at once, but all of these necessary specialties will, however, undoubtedly be manufactured in the near future, so that in my opinion before another year has passed every color which is necessary to American consumers will be produced in this country.

Quality

There is a popular impression that American manufactured colors are not as good as those manufactured in

Europe, Germany particularly, and this is an impression I wish to definitely correct, in that it is not a fact, for the reason that the American colors are made from practically the same chemical formulæ as the European colors and are practically the same products in every way, the only difference being that European manufacturers, from their long experience, may get a larger yield from the same formula than the newer American manufacturers, and the American cost may therefore be more, but this does not affect the products, which in my opinion are equal in every way to the products made in Europe

Silk

For silk manufacturers, for instance, some of the same colors which they used before the war have been available since the war—viz. Azo yellow, orange, scarlet, black, fast red, Bismarck brown, nigrosines, indulines, methylene blue, methyl violet, etc., therefore these colors are just as good now as they ever were, and the goods dyed from them should naturally be the same as before the war. Some of the special colors, however, such as rhodamine, auramine, Victoria blue, acid light blue, acid green and acid violet, have not yet been manufactured for the reasons I have already mentioned, that is, lack of the necessary raw materials and lack of ability of any one to take up everything all at once. But these colors, as I have already said, will in my opinion be manufactured before another year has passed. Some of these colors have, however, been imported from England and Switzerland, so that some of them have been available, and the fancy shades produced from them have therefore been more or less obtainable.

In addition to these aniline products for silk dyeing, such vegetable dyes as logwood, indigo, gambier, etc., have been obtainable, so that speaking generally the silk manufacturers have been able to secure practically all the staple products which they need for their purpose, and are now in a very satisfactory condition as to their dyestuff supplies.

Woolens

For woolen manufacturers we are now able to supply chrome colors suitable for men's wear, sweaters, heavy woolens, etc., in black, blue, brown, green, yellow and red, which are practically equal as to fastness to any colors which have heretofore been manufactured in Europe, and for ladies' dress goods, piece dye worsteds, carpets, worsted yarns, etc., we are able to furnish some acid colors in practically every shade, which are in every way equal to European colors.

Cotton

For cotton goods, we are able to furnish sulphur black, suitable for all fast work except bleaching, practically all direct colors suitable for all cotton work except a small proportion of wash fabrics such as shirtings, and basic colors such as blue, red, brown and green for *printing,* etc.

Leather

For leather, and other industries, we are also able to furnish practically every color which is needed.

Summary

Therefore, the whole situation is at present very satisfactory, and as I have said, every American consumer should be able to obtain practically everything he needs for next year.

Fast Colors

I might say it has been particularly misunderstood by the public that American colors are not as fast as European colors were, and it seems to be the custom now for saleswomen and others in the stores, as well as the garment dyers, to specifically state that they do not guarantee colors, because they are no longer able to get the foreign colors, and I wish to say in this connection that as far as I know, no manufacturer or retailer has ever guaranteed colors even before the war, although this fact may not have been mentioned, and the only reason it is mentioned now is through a misunderstanding of the situation. Such fancy colors as ladies usually want in silk, worsteds, etc., such as pinks, light blues, light greens, heliotrope, etc., were never fast, and as far as I know, there have never been any colors which would dye them fast. In any event, the word "fast" is more or less a misnomer, as a color which is absolutely fast to everything, such as washing, fulling, light, exposure, alkalies, acids, etc., is practically unknown, so it is only comparative fastness which is meant in speaking of fast colors, and to this extent the present American colors, such as they are, are just as fast as the same colors made in Europe. There are some colors called vat colors, which are unusually fast in the above connections, but they are not manufactured in this country and have never been used to any large extent, for light shades. For all ordinary fastness we are now able to furnish colors for cotton, wool and silk in blacks, blues, browns, and some other shades, so that the question of fastness is no longer a question, and it is usually only mentioned by customers who have the wrong impression of conditions.

Prices

In connection with the high prices now charged by American manufacturers of colors, many consumers are under the impression that this is because of the high cost of manufacture here as compared with Europe, but as a matter of fact, the reason is the abnormal conditions, in that the raw materials used for the manufacture of colors, like benzole for instance, are very much higher than normally, being used for explosives, and other war purposes, and this high cost of raw materials, together with the high cost of labor, under the present conditions, is what causes the high prices for American colors, and by the way, these high prices also rule in Europe, as is shown by the extremely high prices asked for such colors as have been brought over from Germany by the submarine "Deutschland," and other colors which are being imported from Switzerland, the prices on all of these imported colors being higher even in proportion than the American colors. Whenever normal conditions again prevail, and raw materials and labor are at normal costs, then the prices of American colors, as well as European colors, will resume the normal figures. In any event, American manufacturers who buy dyestuffs, have no reason to complain of the higher cost, because they, on their part, have in most cases advanced the cost of their products more than the proportionately higher cost of dyestuffs, as the cost of dyestuffs as a general rule, is a very small percentage of the cost of manufactured textiles, either wool, cotton or silk, and American textile manufacturers to-day are more prosperous as a rule, than they ever were.

American Manufacturers Prosperous

In conclusion, I wish to call special attention to the three important points in my remarks:

FIRST: That the colors made in America are fully as good in every way as those made in Germany or any other country.

SECOND: That we are able to furnish colors for most purposes, which are fully as fast as German or other European colors, and there is therefore no excuse nor reason for people not being able to get these fast colors on such materials, on which they formerly required fast colors.

Present Conditions

THIRD: The definite answer, in connection with the manufacture of dyestuffs in America, is therefore, as you will understand from these remarks, that the present condition of the dyestuff supply is very satisfactory, and the future outlook is still more satisfactory in that we will make more colors, and everything indicates that the larger part of the business will remain in the hands of American manufacturers even after the war, instead of in the hands of the European manufacturers, who in former years have had a practical monopoly of this business.

The Relationship of Manufacture of Explosives to Manufacture of Dyestuff

Address Before National Silk Convention, November 23, 1916, at Paterson, N. J.

DR. W. BECKERS*

It gives me great pleasure to address the Second National Silk Convention on "The Relation of the Manufacture of Explosives to the Manufacture of Dyestuffs," and "The Manufacture of Dyestuffs in America; the Progress Made, and What is to be Expected in the Future."

In dealing with the first subject, I would like to say that on account of the fact that the same basic raw materials are used for both the manufacture of explosives and dyestuffs (for instance, benzol, toluol, phenol, nitric, sulphuric and muriatic acids, etc.), and as the machinery used in both industries is of very similar construction, the relationship is quite close. That a dyestuff plant can be very soon turned over into an ammunition plant has been well demonstrated by the fact that soon after the outbreak of the European war all the dyestuff plants in Europe were manufacturing explosives for their respective countries. The training of the chemists, foremen and laborers in a dyestuff plant is such that it will enable them to turn from the manufacture of dyestuffs to that of explosives on only a very short notice. So any country that wants to be prepared, and has its national defense at heart, should look out for the firm establishment of a dyestuff, or in general, an organic chemical industry within its borders, a wisdom which has proven so beneficial to the German government, as during this terrible war, Germany, having a well established dyestuff industry of her own, did not have to rely on foreign countries for her supply of explosives, as the Allies had to.

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*(President and Chairman of Board of Directors, General Manager, W. Becker's Aniline & Chemical Works, Inc.)

Turning from this less agreeable subject to the peaceful manufacture of aniline dyes, I would like to say that the progress made in this country since the outbreak of the war must be called phenomenal. Small concerns with little plants have turned into large manufacturing establishments, producing millions of pounds of aniline colors. Not for advertising purposes, but so as to illustrate the enormous growth of the American dyestuff industry, I have put before you pictures of the 1912, 1914 and 1916 plants of the concern which I represent. In showing you these pictures I do not think I have to give you many statistical figures to demonstrate the growth of our concern. The same development has taken place with other dyestuff manufacturing concerns; besides that, quite a few new concerns were started, which were not in the dyestuff manufacturing business when the war broke out.

Now let us investigate how such an enormous and rapid growth was possible. It was made possible through the protection which the war, through its embargoes, interruptions of shipping, etc., had given our industry. Before the war, the idea was created broadcast, by those interested in keeping away from this country the establishment of a dyestuff industry, that dyestuffs could not be made in this country because we had no experienced chemists to solve the problems turning up in the course of manufacture. But how is it that suddenly the chemists were here to do the trick, when they were put up against the emergency? Only because the conditions created by the war were favorable enough to let skill, energy and capital expect the proper reward.

Of course, gentlemen, we American chemists are not as experienced in the manufacture of dyes as our German colleagues, who have been making these products for the last half century. The American chemists had the fundamental chemical knowledge, but did, naturally, not possess the manufacturing experience with its hundreds of thousands of problems, or as Mr. Dow, of the Dow Chemical Company, Midland, Mich., a large and experienced manufacturer of pharmaceutical chemicals, said before the Ways and Means Committee in Washington, during the dyestuff tariff hearing: "We do not know as yet the 'tricks' of the trade!" Indeed, gentlemen, there are many tricks to be learned before the great number of products necessary to satisfy the demands of the dyestuff consuming trades in this country can be made satisfactorily and efficiently in these United States. Just to illustrate this, I will put before you silk hanks, dyed with four of the most important colors used by the silk dyers, namely, methyl violet, methylene blue, fast red and azo yellow. We have dyed these hanks once with the imported products, and once with the domestic products, as they are being manufactured now, while the other hanks show the respective products when we started to manufacture them, and once after quite some experimenting had been done to improve the very dull shades first obtained. You see how we, step by step, improved upon these shades, until we finally succeeded in bringing them up to the standard shades of the imported products.

As you see, gentlemen, the aniline colors can be made in this country, just as good as in Europe, the only question being: Can we make them as cheap as they are made abroad? This question can only be positively answered after we have had a chance to manufacture for a few years under normal instead of, as we are doing now, under absolutely abnormal conditions. But, having been engaged in the dyestuff business for the last fifteen years, I can say that, if we continue to improve our yields as we have been able to improve our shades, we will finally reach the efficiency so well standardized by our colleagues on the other side. It will interest you to know that, in starting new processes, we begin as a rule with a yield of only 20 per cent, or even less, while we know the yield should be 80 to 90 per cent, but keeping on experimenting we finally succeed in getting proper yields as we get proper shades.

After discussing the progress made in the aniline dyestuff industry in this country, I like to go over to the question: "What is to be expected in the future?" and in doing so, gentlemen, I have to say that the future of the American dyestuff industry depends very much on you, as consumers of our products. Since the war broke out you have undoubtedly assisted us greatly in our endeavors to develop and refine our manufacturing processes. If you would not have been broadminded, as you are, and would not have taken from our hands ton lots after ton lots of such dyestuffs which were not quite up to standard shade, we would have gone bankrupt at the start. And why should you not have taken these off-shade lots from our hands, and by doing so enable us to keep on these very expensive experiments? It is only necessary for you, who consume dyestuffs, to arrange matters so as to be able to assist us quite extensively! Take, for instance, methylene blue. A very large quantity of this bright blue is used in shading blacks on silk. You will understand that methylene blue which is not quite as bright as it ought to be, may just as well be used for this purpose. The little black, which is incidentally in the off shade product, does not interfere with the final results which you get, if you just take a little less black and top the black with more blue. From this little instance you can see how co-operation helps us and you at the present time; and it is your co-operation which our infant American dyestuff industry needs so very badly to establish itself permanently. By our combined efforts, you as consumers and we as manufacturers of aniline colors have been able to get from a Government committed to a "tariff for revenue only" policy, at last something like a protective tariff, on which, I think, we can take a chance, or, if you want to call it so, gamble to see how we come out when conditions get normal again. But it will be necessary, gentlemen, that you bestow the co-operation and assistance which we have received, and are receiving from you on such a large scale during the present upset conditions, on us also later on, when times become normal again. Don't be too particular in regard to shades when the American dyestuff industry brings out new products! Try to use the products of the first attempts whenever there is any chance of using them! Do not kick against the newcomer who is trying to enter the circle of the well-established American industries! Do not kick him out if you would have to pay him a penny per pound or so more than you would have to pay for imported products! One thousand millions of dollars per year is the turn-over of the American textile industries, and only about $10,000,000 worth of dyestuffs enter into these textile goods, or, in other words, only 1 per cent of the cost of the goods. The small fraction of this 1 per cent which the American public would eventually have to pay for a few years is made up a thousandfold by the fact that later on the millions will stay in this country, instead of going to foreign countries, giving employment to thousands of highly-skilled employees and laborers. Consider this fraction of 1 per cent as a tuition fee the American public is paying for the tutoring of our American chemists, our American dyestuff machinery concerns, and our American workingmen! All of them have to learn—and remember that a great deal of learning was necessary when your own industries were established!

If we will have your good will and your co-operation, gentlemen, in the future, as we have enjoyed it during the last two years, I can assure you that within a few years from now you will find your industry independent from other countries for its supply of dyes.

Having tried to give you a picture of what has been accomplished in, and what may be expected from the American dyestuff industry, I conclude with the sincere wish that the industry you represent, and which is engaged in handling the noblest of all fibres—that this noble industry will be found foremost in the rank of those who with untiring effort will work to the final accomplishment of that noble and worthy task, namely, the firm establishment of an American dyestuff industry, so absolutely necessary for the industrial and military independence of our great beloved country!

The Color and Dyestuff Situation

Extracts From
Address Before National Association of Hosiery and Underwear Manufacturers, La Salle Hotel, Chicago, Ill., December 5th, 1916

I. F. Stone

One of the most suggestive talks made at the meeting was that of I. F. Stone, of the National Aniline & Chemical Company, who spoke on the dyestuff situation. He recalled that he had promised the association at a previous meeting to produce fast colors that would meet the requirements of the trade, and said that the promises had been made good.

"Our direct black has been successful," he said, "and later on our sulphur black was introduced and made good. With acid blacks now available for knitters of wool, the situation seems to be in good shape.

"Our colors are fast, for they are made by the same formulæ and by the same chemists who made them abroad.

"In fancy shades we have nothing to offer, as pinks, heliotropes, light blues, etc., must be obtained from Switzerland and other foreign countries, but black, navy blue and tan dyestuffs are now to be had in satisfactory quantity and of a satisfactory quality right here at home."

Mr. Stone also defended the prices quoted on American dyestuffs, pointing out that while prices may be three or four times as high as formerly, those imported via the "Deutschland" are bringing from ten to twenty-five times their normal values. He likewise pointed out that the cost of materials used in dye manufacture has ascended violently, and while in some cases the costs have come down, they are not reduced sufficiently to relieve the situation entirely. Besides, he pointed out, users of dyestuffs are now taking profits

[From *"Cotton,"* issue of January, 1917. "Western Knitters Meet at Chicago"] which are sufficiently large to enable them to absorb the increase. He related an instance or two to show how the situation has been taken advantage of by the retailer who wishes to boost the price on account of the supposed scarcity of dyes.

"American production," he continued, "will be sufficient in 1917 to take care of the entire requirements of the domestic trade. The expansion of the busness has been enormous and rapid. At the beginning of the war there were five manufacturers of coal tar products in this country. Now there are 124 making colors and intermediates. And the industry has progressed so that practically all the standard colors can be supplied next year.

We commenced operations December 4 in our new factory, and our production is now ten times as large as it was before the war. Then we were producing 3,000,000 pounds of color a year. Now our production is 36,000,000 pounds.

"When the war is over American manufacturers of dyestuffs will be much better able to compete with German manufacturers than ever before, because the expansions which have been made have been provided for principally out of profits instead of new capital."

In answer to questions Mr. Stone said that the reason developed black had not been given much attention was that the demand for direct black and sulphur black was so much larger that the other item was relatively unimportant. He said that the silk hosiery manufacturers are using direct black, but for silk piece goods are using logwood dyes. The direct black is treated afterward with formaldehyde, which makes it a fast color.

In discussing the possibility of reduced prices on dyestuffs, Mr. Stone said that the export demand for benzol, which is being used for making explosives, is holding up the market. After the war, he predicted, it will come down sufficiently to enable it to be used as an automobile fuel. He said that he did not look for any reduction in color prices until after the war, when very nearly normal figures should be restored, though he questioned the ability of the manufacturers to reduce their labor costs, which have been increased 100 per cent during the war period.

Discussing the question of fastness in colors, which he said was a relative term, as no color is fast to everything, Mr. Stone said that the American industry has made great progress in the past two years, even though they have not done what it has taken the Germans forty years to do. He expressed the opinion that with the present tariff, which provides a 5-cent specific duty plus a 30 per cent ad valorem duty, the former being decreased 20 per cent a year, so that it will be eliminated in five years, the European manufacturers will not be able to get the hold they had before the war. Likewise, he declared, American users of dyestuffs, who did not formerly realize the importance of this business in their own industries, will support the American makers hereafter, a statement which was greeted with applause.

The Domestic Dyestuff Industry

Article in American Wool and Cotton Reporter, January 18, 1917.

I. F. Stone

The manufacture of aniline dyes in the United States began in the 1870's, and our factory, now known as the Schoellkopf Aniline & Chemical Works, Inc., was established in Buffalo in 1879, by two brothers, J. F. Schoellkopf and C. P. Hugo Schoellkopf, both of whom are still actively identified with the factory and have consequently had a continued experience of over 36 years in the manufacture of coal tar products.

In about 1880 there were ten factories in the United States engaged in the manufacture of aniline colors, but owing to adverse tariff legislation in 1883, most of them dropped out, until, in about 1890, there were only three left in operation. In 1898 there was a new factory started, and in 1914 another new one, so that at the beginning of the present European War there were five factories actively engaged in this industry. The Schoellkopf factory, however, from its inception, and up to the present time, has been the largest of the American factories; and since the European War it has developed the most rapidly, I think I can truthfully say, of any other American factory, so that it still holds its position as the leading industry of its kind in the United States. It now has many buildings covering some forty acres of land and an investment of several millions of dollars, employs upward of two thousand people, and its

PRODUCTION OF COLORS

is many times larger than at the beginning of the European War. With this increase of production it is now able to serve the American consumers with enough of such dyes as direct colors for cotton, wool and union goods; acid colors for woolen and silk goods; chrome colors for woolen goods; sulphur colors for cotton goods; basic colors for paper, silk and leather; and nigrosines for general purposes, so that the shortage of supply of these colors, occasioned by the war, has now been overcome by our factory until we are at present in a position to furnish consumers with sufficient to meet reasonable demands, and those who took the precaution of contracting with us last year (1916) for their estimated supplies for this year (1917) will have all of the colors for which they have consumption, and, consequently, there is no question of shortage as far as our works are concerned.

The other factories have also developed rapidly and new factories have been established, so that instead of the five original factories there are now some

120 FACTORIES

engaged in the manufacture of coal tar products—aniline dyes and intermediate products, but aside from those manufacturing the intermediate products the original five factories are still by the far the largest and most prominent in the production of finished colors, and all of these factories, together with our own, are now producing all the necessary colors to meet the reasonable demands of American consumers. The only important colors not now manufactured in the United States are indigo, indigo and indanthrene derivatives, known as vat colors and alizarine colors, although there is now being erected a factory for the manufacture of indigo, and should the present conditions continue for a sufficient length of time, no doubt the vat colors and alizarine colors will eventually be produced.

The final result of the advance in the manufacture of coal tar products is that this industry is now so well established in the United States that there is no question but that they will in the future control the bulk of the American business and will be able to compete successfully with European factories after the war is ended, if the United States Government will continue to give them with an inclusion of what is known as the anti-dumping clause, viz.: the preventing of dumping into this country by European factories colors at lower prices than they are sold for in other countries, for the purpose of preventing the success of the American factories.

I repeat that the Schoellkopf Aniline & Chemical Works, Inc., and its selling agents, the National Aniline & Chemical Company, the largest concerns of their kind in the United States, and the successful increase in their production during the war has been of great benefit to American consumers,—so much of a benefit, in fact, that I do not know what the American consumers would have done if we had not been able to take care of them.

Expansion of the American Dyestuff Industry

Pressure of Necessity Put American Practical Scientists on Their Mettle and Produced Astonishing Results.

T. H. NORTON, Ph.D., Sc.D.*

Among the economic results in this land, consequent upon the existence of the world conflict across the water, none has equalled in permanent importance and in dramatic interest the swift evolution of a distinctly American artificial dyestuff industry.

Prior to the war there was such an industry—in name. In some six establishments less than 400 operatives manufactured so-called "American coal tar colors" to the extent of 3,300 short tons annually. As a matter of fact, the manufacture consisted in the "assembling" of coal tar intermediates, made almost entirely in Europe, chiefly in Germany. Nine-tenths of the work involved in producing a pound of these "American" dyes had been performed on the banks of the Rhine, or the Main, or the Spree. The bulk of the artificial colors regularly consumed by our textile, paper, ink, varnish, pigment and allied branches was imported directly from Europe. Of the 26,000 tons thus brought over 22,000 were of German origin.

To-day we are fast approaching the point at which nearly all of the staple synthetic dyes normally needed in the nation's industrial activities will be regularly produced in American factories from American coal tar and by American chemists and operatives. This has meant a marvellous joint effort on the part of all concerned—capital, technical

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Article appearing in N. Y. Journal of Commerce, Feb. 5, 1917.

* Chemical Expert of the United States Department of Commerce.

and executive staffs and skilled labor. The annals of our industrial evolution present no similar example of the swift creation of a new form of productive mechanism, the most complex probably on our planet.

In the first place, it has been necessary to vastly enlarge the output of our coal tar industry so as to furnish in abundance the few "crudes" from which an army of useful products are systematically derived. Benzol, toluol, naphthalene, phenol and their homologues are now produced on a scale adequate for the world's needs under normal conditions.

Next came the manufacture on a generous scale from these crudes of the various intermediates required to make not only dyestuffs but synthetic medicinals, high explosives, photographic chemicals, artificial perfumes, etc. The only intermediate manufactured here before the war was aniline. There was a modest annual output of 800 tons. To-day the yearly production is 25,000 tons. A host of other intermediates, none of which were regularly made in the United States three years ago, are now currently produced in American works. Before the close of 1917 there will be few, if any, coal tar intermediates not regularly made on our soil.

Finally we witness twoscore establishments systematically turning out finished artificial colors on a vast scale, constantly increasing in variety and total amount. The output is now at the annual rate of about 27,000 short tons. With the advent of 1918 it will probably exceed 30,000 tons.

The efforts of those engaged in building up this new industry have been chiefly concentrated, at the outset, upon the manufacture in great quantities of a few important staple dyes, enough to meet the more pressing needs for an adequate gamut of color in the case of each of the leading textile fibers, of paper, ink, leather, etc. At present over 100 such synthetic dyes are regularly made.

The total number of distinct dyes and modifications of dyes, as enumerated in the "Census of Dyestuffs," published at the close of 1916 by the Bureau of Foreign and Domestic Commerce, is 5,675. Many of these are consumed in quantities ranging annually from 100 pounds to 5,000 pounds. The necessary arrangements for producing all of these minor tinctorial forms will be made in due time, but at present circumstances dictate the concentration of effort and equipment upon a few of the leading types.

We are thus fairly on the way to witness the creation on American soil at a very early date of a symmetrical, well rounded, comprehensive American synthetic color industry, emancipating us very soon from all dependence upon foreign sources of such dyes as we use in tolerably large amounts.

A very few colors of recent invention and of pronounced permanent value, notably in the anthracene, indanthrene and carbazole groups, will continue to enjoy patent protection for periods ranging from one to eight years. Prospectively we may look forward to 1925 as a date when, at the present rate of expansion, the American production of synthetic colors should cover the entire American demand.

Two typical cases may serve to illustrate the rapidity and the resolute determination with which American enterprise is tackling the big problem.

Artificial indigo is the most important synthetic coal tar derivative consumed in this land. The importation for the fiscal year 1913-1914 was 8,500,000 pounds, consisting chiefly of the 20 per cent paste. The great "Badische" works on the Rhine expended $5,000,000 in perfecting the manufacture of this dyestuff before a single pound was placed upon the market.

Late in 1915 a strong American chemical company began the construction of the requisite plant for the production of artificial indigo. Over $500,000 has been invested in this plant, which is now about to furnish two and one-quarter short tons daily of the 20 per cent paste, or about 750,000 pounds annually. It will cover about 9 per cent of the domestic consumption. When construction was begun in 1915 indigo was on the free list. Since September 8, 1916, there is a protective duty of 30 per cent.

Next to indigo comes sulphur black in point of importance. The annual consumption in the United States was 5,600,000 pounds during the fiscal year 1913-1914. The entire amount came from Europe. About twenty American companies have entered upon the manufacture of this color, and the point has now been nearly reached when the production is fully equal to the normal domestic consumption.

A general review of the situation is incomplete without some reference to the role played by natural organic colors. The pinch of a genuine "dyestuff famine" at the close of 1915 was largely alleviated by a vastly augmented output in American factories of the staple, old-fashioned colors, such as logwood, fustic, quercitron, cutch, hypernic, etc. This has led to a more generous and general recognition of the actual value of the natural dyes in any well-balanced scheme for tinctorial practice. In the future under normal conditions intelligent American dyers will use this category of colors far more freely and much more effectively than has been the case for a generation past.

In this connection we may well be proud of what has been done by the combined efforts of the Forest Service and of private enterprise in adding the beautiful yellow of the osage orange to the series of natural dyes of recognized commercial and tinctorial value.

Of possibly equal promise is the delicate "golden leaf" color, the manufacture of which has been perfected during the past few months—a product of our Northern forests.

All in all, 1916 is a memorable year in the annals of American chemical technology; and the most brilliant page is that devoted to the achievements of the men creating our new, national, artificial color industry.

Should a Protective Tariff Be Enacted for the Dyestuff Industry?

Article in The Journal of Commerce, Special Annual Edition, February 5, 1917.

I. F. STONE

The answer to this question is very simple, viz., "Yes," for on looking over the experience of the dyestuff manufacturers of aniline colors was first established in the United States it will be found that about 1880 there was some ten factories enaged in the manufacture of these products, and it looked as though it would be a very successful industry, as tariff conditions at that time were favorable to such enterprises. Unfortunately, however, in 1883 a new tariff law was passed, reducing the tariff protection on colors to such an extent that the industry was no longer possible and consequently most of these factories dropped out until at one time there were only three engaged in this manufacture. These were carried on more or less by the ambition of their owners that some day conditions would be changed rather than at a profit. One of these factories particularly lost a large amount of money up until the time it finally reached some success, about 1900. About 1898 another factory was established, and then about 1914 still another was established, so that in 1914, at the beginning of the present European War there were five factories engaged in this industry, but none of them on a large scale and none of them were successful enough to make a complete line of colors and were restricted to only a few of these which might be made to advantage in this country, therefore the industry was not a large one up to the beginning of the present European War, viz., about August 1, 1914.

The reason for this condition was that since 1883 no favorable Tariff Bill was passed to encourage this industry, consequently no particular progress was made. Upon the beginning of the European War however, when it was impossible to import colors and dyestuffs from Germany, a great shortage in the dyestuff supply was the consequence and it then became evident that the dyestuff industry in this country were in existence in the beginning of the war could never occur again and American consumers could rely on American manufacturers for their supply.

As about 80 per cent of the aniline colors and other coal tar dyes were exported into this country by Germany when Germany was prevented from this exportation by the war, a great development in the industry in this country began, until at the present time there are some one hundred and twenty factories engaged in the manufacture of various products which are necessary for American consumption and the supply for 1917 is therefore ample for all necessary colors.

This development was entirely due to the European War and not to a protective tariff, so that the point is now that if this industry is to be continued in this country on a large scale a sufficient protective tariff must be given it or the bulk of the business will again return to Germany after the present war is over. To meet this emergency a bill was recently passed (H. R. 16763), increasing the duty on aniline colors from 30 per cent ad valorem to the same duty ad valorem, plus 5c per pound specific duty, and on what we call intermediate products to 15 per cent ad valorem, plus 2½c per pound specific duty. On such coal tar products such as indigo, alizarine and anthracine derivatives, known as vat colors, where no protection was formerly given, an ad valorem duty of 30 per cent was given, so that the industry as it now stands, has this additional protection, for the time being. The disadvantage is that this 5c per pound specific duty is only for a period of a few years, that is, is reduced automatically each year 1c per pound for five years, so that at the end of five years the original duty goes into effect again.

A committee appointed October 9th, 1914, by the American Chemical Society (New York Section) to investigate the subject in the fall of 1914, made a very careful report on November 6, 1914, recommending that in addition to the 30 per cent ad valorem duty then in effect, a specific duty of 7½c per pound should be given on aniline colors, and in addition to the 15 per cent ad valorem duty on intermediates, a specific duty of 3¾c should be given, but Congress in passing the present bill seemed to disregard the opinion of these experts and only gave the above mentioned 5c per pound on aniline colors and 2½c on intermediate, atlhough they did also add the 30 per cent ad valorem duty to the other products, viz., indigo, alizarine and anthracine derivatives, which were formerly on the free list.

Whether the bill recently passed will then give enough protection to insure the continuance of the present rate development in the coal tar industry is a serious question, and in my opinion the matter is so important to American consumers of these products that the matter should be gone into very carefully again by the Government, and if it is found that the present protection is not sufficient then a new bill should be passed which would protect this industry to its full extent, as after the war it is evident the European manufacturers will make every effort to regain the business they have lost during the war and even with the present tariff against them will probably be able to make prices which will make it impossible for the American manufacturers to compete, as the American manufacturers are at a disadvantage on account of the extremely high prices of labor and raw materials in this country, and to some extent to their lack of fifty years' experience which the European manufacturers have had; then again the great German factories are now in one great convention or combination and will accordingly fight as a unit to regain the American business, and this great unit is obviously able to do what individual manufacturers could not afford to do, in that their combined production and consequent lessening of selling expenses might easily overcome the present tariff.

In conclusion, I will repeat that it is imperative that the

Government of the United States should give this matter immediate and careful attention and in the end, give this industry a protection which will insure its development and stability in the years to come.

The Development of the Aniline Color Manufacturing Industry in America

Article in Oil, Paint and Drug Reporter, Special Annual Review Edition, February 9th, 1917.

I. F. STONE

In writing on this subject it may be interesting to briefly sketch in the beginning, a history of this industry from its first inception in this country, and I beg to say in this connection that the first American aniline factories were established about 1875. By about 1880 there were some ten factories engaged in the manufacture of these products, and it looked as though it would be a very successful industry, as tariff conditions at that time were favorable to such enterprise.

Unfortunately, however, in 1883 a new tariff law was passed, reducing the tariff protection on colors to such an extent that the industry was no longer possible, and consequently most of the factories dropped out until at one time there were only three engaged in this manufacture, and these three were carried on more or less by the ambition of their owners that some day conditions would be changed, rather than at a profit. One of these factories, particularly, lost a large amount of money up to the time it finally reached success in about 1900.

About 1898 another factory was established, and then along about 1914 still another was established, so that in 1914, at the beginning of the present European war, there were five factories actively engaged in this industry. Owing, however, to the intense competition of the European manufacturers, especially the Germans, none of these factories were successful enough to make a complete line of colors, and were restricted to only a few of those which could be made to advantage in this country, therefore the industry was not a large one and was not running to any considerable extent. One reason why the industry could not operate successfully was the lack of what we call intermediate products, that is, products made from benzole and naphthaline (coal tar derivatives) which are the bases of the manufacturing of practically all aniline colors, as none of these intermediate products were manufactured in this country up to 1914, when the war commenced, with one exception which I will mention later. The American manufacturers were therefore obliged to rely entirely upon European factories for their raw materials; in other words, the intermediate products, and naturally, the European manufacturers charged them such a price that they could not successfully compete with the finished colors of Europe, which were made from the same intermediate products, but which were secured by the European manufacturers naturally at a lower price than they could be secured by the American manufacturers who imported them.

The single exception to this statement is that in 1910 a factory for the manufacture of one of the intermediates, viz., aniline oil, was established, but had not been at all successful up to the time of the war, owing to European competition, the European manufacturers, by the way, having reduced their price immediately upon the establishment of this American factory.

The situation was then, in 1914, when the war began, that no intermediate raw materials were manufactured here with the exception of this comparatively small amount of aniline oil, and then the supplies of these intermediate products from European factories, that is, German factories, were immediately cut off, just as were the supplies of the finished aniline colors, and the American manufacturers therefore were not able to relieve the situation except to the extent of using up what raw materials they had on hand, which of course were not nearly enough to be of any perceptible help to the consumers of aniline dyes. The situation therefore a few months after the war started, say about

January 1st, 1915, had become very acute, as practically all the stocks of imported colors which were here at the beginning of the war had been consumed, as had also the raw materials employed by the American factories in their manufacture of colors, the one exception being a factory which had previously been securing its aniline oil from the American manufacturer, and therefore they were enabled to continue this manufacture of colors without any particular interruption, except the interruption of the lack of foreign intermediates, of which, however, they fortunately had a large stock.

I am not mentioning the names of any of these factories in this article, as I wish to be absolutely impersonal, but there is no question but that the position of this factory just mentioned, with its supply of raw materials, was a great relief to the consumers of dyes in this country, and it was very fortunate for them that a factory had been established for the manufacture of aniline oil and that as American manufacturers of colors they had taken the precaution to secure their supply from this American factory, even though they were obliged to pay a higher price than they could have imported the oil for at the time. They preferred, however, to do this in order to encourage the American manufacturers of these intermediate products.

Very soon after the war, however, it became apparent that there would be a great necessity for the manufacture of these intermediate products in this country, and as the basic material, that is, coal tar, is of course a large domestic product, it was then only necessary to recover its derivatives, such as benzole and naphthaline, and benzole particularly being needed for explosives and other war purposes, was the first product which had the attention of the American producers. The production was increased gradually until it has reached at the present time something like thirty million gallons annually and against about three million gallons prior to the war, and the production of naphthaline has also increased largely owing to its demand for use as a raw material in the manufacture of these intermediates, although not so much an extent as benzole.

The manufacture of intermediates gradually increased to such an extent that there are now being manufactured a large variety, such as alpha naphtylamine, beta naphthol, benzaldehyde, benzyl acetate, chlor-benzole, dimethylamine, di-nitro-benzole, di-nitro-phenol, nitro benzole, paranitraniline, paraphenylenediamine, toluidine, and others too numerous to mention, so that American manufacturers of colors are now able to get a fair supply of these intermediates, and are therefore enabled to make a more complete line of colors than was possible at the beginning of the war, viz., 1914.

As I have previously mentioned, the first large intermediate to be manufactured, however, was aniline oil, the factory which originally manufactured it before the war, immediately increasing its production, and many other concerns starting in later on, until it came to a point where the production was fully, if not more, than equal to the demand, and the fact is, that factories making this product are in such a strong position that it is doubtful whether it will ever again be imported from Europe to advantage.

Another intermediately, the manufacture of which was commenced largely, was chlor-benzole, which is used in the manufacture of sulphur black, a very important color for cotton goods, and for which there is a large sale. The manufacture of this color, by the way, is now so large that it is fully equal to the consumption, and is again another product which will probably never be imported again to advantage. Other intermediates followed, until as I have said, at present we are able to obtain a sufficient variety to manufacture a line of colors which will probably take care of the necessary shades, which includes blacks, blues, browns, reds, yellows, greens, orange, violet; the seven primary colors, from mixtures of which practically every shade can be obtained for all materials such as woll, cotton and silk.

It has been stated that American manufacturers were not on a firm basis, in that they had followed the lines of least resistance in making colors, that is, making colors which were easiest to manufacture, and that when the war was over and competition came again from Europe they would not be able to stand against the competition. This opinion is not true, in that while it is true that they did follow the lines of least resistance, it so happened that the colors manufactured were the ones most largely consumed, for instance blacks. This is by far the color most largely consumed, being practically half of the entire color consumption of the country, and this was the first color to receive attention of the American manufacturers, it being obvious that a color which could be manufactured in large quantities would mean a less cost for overhead expenses. Therefore there is now an abundance of blacks made for all purposes, sufficient to take care of the whole consumption of the country, for instance: direct blacks for cotton, union, wool and silk, azo black or acid black for wool and silk, sulphur black for cotton (already mentioned), chrome blacks for wool, and nigrosine for leather, inks, etc., so that this particular color is well taken care of. Consumers can get the necessary quantities for consumption next year if they were careful to contract for same in time to allow the American manufacturers to arrange their facilities and buy the raw material necessary to take care of such contracts for 1917.

The next color in importance, which had their attention, was blue, this being next to black in the proportion of consumption. They are now producing blues for the same textiles, viz., wool, cotton and silk, to a very satisfactory extent.

To show the development of this business, would say when we consider that there were only five factories making aniline dyes in the country prior to the fall of 1914 when the war began, I will say that we now have a list of about one hundred and twenty making intermediates and anilines, and as I have stated above, their whole production will take care of the entire country as far as the necessary colors are concerned.

Special colors which are not made here are being imported from Switzerland and occasionally on the submarine "Deutschland," so that consumers are able to get quite a varied line, and there is therefore no real shortage of these products.

Practically the only colors which are not now made in this country of any consequence, are indigo and anthracene derivatives, known as vat colors, for the dyeing of ginghams, shirtings, etc. (although at this time there is one factory being erected for the manufacture of indigo), but it is possible to secure natural products like indigo, logwood, fustic, cutch, flavine, etc., which can be substituted until the artificial colors are either manufactured or again imported. And then alizarine colors, for which there is as far as I know no plan to manufacture, are easily replaced by the so-called chrome colors, which are practically as fast and available for men's wear, sweaters, heavy woolen, etc., in black, blue, brown, green, yellow and red therefore the shortage of these alizarines is really not so serious, and then, there are some colors for lakes called the para colors which are not made here, but the lake manufacturers can easily get what they want by making their own lakes from paranitraniline and beta naphthol, which are made here. A few other colors not made here are such specialties as rhodamine, auramine, patent blue, etc., but some are being brought over from Switzerland and England, and from Germany on the "Deutschland," in fair quantities, so that they are obtainable, and can be used in connection with American colors for blending shades and making mixtures.

In speaking of the increase to some one hundred twenty factories, I must emphasize the fact that the first five already established before the war are the ones who have made the most progress, and are the ones turning out the most staple and satisfactory colors as to quality, etc., and they are the ones who will continue to hold the most of the business after the war, as due to their experience, capital, etc., they are in a better position to do so than the newer manufacturers who have largely depended on inexperienced chemists and on outside capital to take up the manufacture. This is emphasized by the fact that none of the older factories are advertising their stock for sale in the newspapers, nor are they soliciting subscriptions for bonds or in any other way asking for capital, as all of them seem to be in position to capitalize themselves. This being true, they certainly are in a strong position to meet competition after the war, with the advantage they have gained in the meantime through their development and increased production, which will reduce overhead expenses of their factories, as it is obvious that it will not cost as much per pound to manufacture say one million pounds as it would to manufacture one hundred thousand pounds,—the increase in the manufacture of colors being at least ten times more than it was before the war.

The principal point to continue the successful manufacture is the question of the manufacture of the intermediates, on which they depend as their raw materials, and it is the intermediate manufacturers who will need the most help to maintain their position. If they cannot do so through protection granted them by Congress in the last tariff bill, then they should be supported in some other way, by the Government for instance, as I have stated in an address made last year, the Government could establish factories for the manufacture of these intermediates, which would be very desirable because these same factories could be used for the manufacture of ammunition supplies, in case of war, as it is a fact that the raw materials for the manufacture of aniline products are much the same as those used for explosives, so that in making such a move the Government would be protecting itself in case of war, for its supply of explosives, as well as strengthening the position of the aniline color manufacturers by giving them intermediates at necessary prices. This could be easily done by the Government as it is a fact, as I have stated, that the production of the original raw material, coal tar derivatives, viz., benzole and naphthaline, are now in sufficient supply for the production of all necessary intermediates.

There is some criticism as to the quality of the coal tar products made in the United States since the war, but to this I can say that they are identically the same in every respect as the European products, as they are made from the same chemical formulæ, and there is no reason therefore why they should not be fully as good in every way if they are properly manufactured, which they are by the competent factories. The trouble is that people in comparing colors do not compare the same colors, but take some color which is especially adapted for certain purposes and compare it with colors which may be used for the purpose but are not so well adapted, due usually to the ignorance of the people who use colors, but they could get the necessary information as to what colors to use if they would confer with some more experienced manufacturers of colors who would know just for which purpose colors are adapted and what colors could be replaced, in comparison with the European colors.

In regard to the high prices charged by American manufacturers of colors, many consumers are under the impression that these are caused by scarcity, owing to the inability of European manufacturers to deliver their products here, but while this may be true to some extent, the real reason is that owing to the fact, as I have said, that the raw materials for the manufacture of aniline colors are much the same as those used for explosives, the war demands for explosives are so great that it creates a scarcity in the raw materials, and consequently prices are high, and color manufacturers are obliged to pay abnormal prices for their raw material, so that the prices for the manufactured colors are correspondingly high. Not only that, but the cost of labor in the past two years has advanced to such an extent that it is almost double what it was in the normal times. However, the price of American colors in any event, is not as high in proportion, as the European colors, as those colors which are imported are sold for many times more their normal value in this country than are the American colors; for instance, a color known as patent blue, on which the normal price is about $1.00, is being sold as high as $13 per pound for a type which is only half strength, so in reality the full strength type would be selling at $26, or about twenty-six times its normal price, while I know of no American color which is sold at more than about ten times its normal price, and most of the staples are sold at about only five times—for instance, direct and sulphur black, which are consumed in the largest quantities. It is usually the smaller colors which are higher in proportion, due to the fact that the cost of manufacture is more for small quantities than it is for large quantities. In mentioning patent blue, it is only one of many colors, like rhodamine, auramine, the vat colors already mentioned, etc., which come over from time to time, and which are sold at very high prices, much more in proportion than the American colors. The point is that the prices in Europe are evidently quite as high or higher than they are in the United States, therefore, the United States consumer is under no disadvantage as compared to consumers in other parts of the world. As to when products will be back to their normal prices, would say this will come in due course, after the war, and when things get more normal, that is, when materials and labor once more resumes normal conditions, although as far as labor is concerned, it is very difficult to say whether this will again in this country go back to what is was before the war, our laboring people having been educated now to a higher schedule of living, and it is doubtful if conditions will change much in this respect, as it would be difficult to return to a different or former standard. I believe, however, that American consumers will be only too glad to pay labor everything it is worth and consequently a higher price for colors than ruled before the war will be cheerfully paid by our consumers, if they are within reason, which they will be.

To sum up what is now being manufactured, would say that practically a full line of basic, acid, chrome and sulphur colors are being made, and people in criticizing the development of the color manufacture should not forget that it would be impossible for us to do in two years since the war what it has taken Germany over fifty years to accomplish; in other words, make a complete line of colors for every purpose, but in making the staple colors such as we have been able to do and getting them to a point where we can supply the whole consumption of the country, I think we have accomplished wonders in the short period since the war, or a little over two years.

The definite answer in connection with the manufacture of dyestuffs in America is therefore, as I have already stated, that the present conditions of the dyestuff supply are very satisfactory, and the future outlook is still more satisfactory in that we will make more colors, and everything indicates that the larger part of the business will remain in the hands of American manufacturers even after the war, instead of the hands of the European manufacturers who in former years have had a practical monopoly of this business.

Permanence of the American Dyestuff Industry

Written for the Textile Club—Presented at a Meeting at the Hotel Martinique, March 3rd, 1917.

I. F. Stone

In considering this question there must first be taken into consideration the conditions before the present European War when the dyestuff industry in this country was not at all successful and European manufacturers, especially the Germans, had a practical monopoly on the business. The five American factories then in existence were struggling along under very adverse conditions, but even at that they managed to produce from fifteen to twenty per cent of the normal consumption in this country, although they did so at a very small profit on the capital employed and hard effort on the part of the gentlemen engaged in this manufacture.

The adverse conditions under which these American factories worked were, briefly: First, the fact that their raw materials, known as intermediates, were not then produced in this country, but were manufactured in Europe, and they therefore had to depend upon Europe for their supplies; second, the tariff protection extended to them by the United States Government was not sufficient and they could not compete, therefore, with European manufacturers owing to the higher costs of manufacture in this country due to labor conditions and perhaps, also, to the lack of thoroughly experienced chemists; and, third, the policy of the European manufacturers, particularly the Germans, to make such prices on the colors which were being manufactured here so that the American manufacturers could not sell at a profit.

Immediately after the beginning of the present war, however, conditions changed in that it was no longer possible for the German manufacturers to export their colors to this country, neither was it possible for American manufacturers to obtain from Europe their intermediates (raw materials) which they needed to manufacture colors; therefore, it became necessary, in order to manufacture in this country the necessary quantities of finished colors, to provide for the manufacture of these intermediates, and during the war the manufacture of such intermediates has been so well established that there is now a liberal supply of these materials and the American manufacturers of colors are therefore able to manufacture practically all of the necessary colors consumed in this country. When I say all, I do not mean every color which was manufactured in Europe and which was formerly consumed in this country, as there are many specialties which had not yet been made here, but these specialties are not actually necessary in that the colors now produced here are those of which there is the largest consumption, like blacks, blues, browns, reds, greens, violets, orange, yellows and other suitable colors used for woolens, cottons, silks, leather and all other materials on which colors are needed.

It being a fact that the American manufacturers *are* now able to produce all of the necessary colors needed, the question then is whether this will be a permanent industry or whether the conditions which prevailed before the present war will again be the same, in that the European manufacturers may be able to flood the country with their colors at prices with which the American manufacturere cannot compete. It gives me much pleasure to be able to answer this question very definitely in the affirmative, viz., the dyestuff industry of this country is now on a permanent basis for the following reasons:

First—The production of coal tar derivatives, like benzol and naphthaline, has been increased to such an extent that the quantities produced are now from five to ten times more than before the war, and the manufacturers of intermediates, depending on these products, will continue to be able to get a fully supply at prices which will compare favorably to European prices on account of the largely increased production, it being well known that the United States has practically inexhaustible supplies of coal, which is the base product and from which will be derived the benzol and naphthaline and other products necessary for the manufacture of the intermediates and from them the manufacture of the finished colors.

Second—The United States Government has finally discovered that in order to make this industry permanent it is necessary to give more adequate tariff protection, therefore a tariff bill, known as H. R. 16763, was passed in 1916, giving a protection of 30 per cent ad valorem and 5 cents per pound specific duty on finished colors, and 15 per cent ad valorem and 2½ cents per pound specific duty on intermediates, the addition to the old tariff being the 5 cents and 2½ cents per pound specific duties just mentioned, and this additional protection gives the American manufacturers a very much better opportunity to operate, although, even at that, a higher protection would be still more important if it could be obtained. The exception to the above protection is that on indigo and what is known as indigoids and alizarine colors, no specific duty was imposed although they were given the 30 per cent ad valorem duty as against the fact that they were free before this bill was passed. There is no specific reason why these colors should not also have this specific duty, and why they were excepted in the passing of this bill is a question for those who passed it to answer, and I believe that upon mature condition this exception will be cancelled and all of the colors now manufactured in this country will have the same protection, which they certainly should have.

Third—The manufacturers of intermediates and colors have, during the war, been able to obtain, owing to abnormal conditions, an abnormal rate of profit, and out of this abnormal profit they have been able to build and pay for their factories as well as accumulate a surplus profit which they can use for the further increase of their present production and the working out of the special colors not now manufactured here.

Fourth—The American consumers have realized, due to the conditions prevailing since the war, the importance of having an aniline industry in this country which will in the future prevent any repetition of the conditions which prevailed just after the war, when it was for some time impossible to secure enough colors for the consumption of the country, as a consequence of which many consumers were obliged either to run their mills or factories only a part of the time, or, as in some cases, close down entirely. With this realization, therefore, they will undoubtedly give the preference to American-made products, which in itself would help in the competition against European manufacturers after the war.

To sum up briefly the whole question of the permanency of the American dyestuff industry, it is apparent from the above that with factories capable of producing the colors necessary for consumption, an adequate tariff protection by the Government, a strong financial condition established during the war, and the preference of American consumers for American products, we have certainly insured the permanence of the American dyestuff industry.

ADDENDA

To conclude this book up to the present date, April 1st, 1917, it will be, perhaps, interesting to extract in a brief article the principal points in the various articles and addresses contained herein.

It will be observed that at the beginning of the war, about August 1st, 1914, the manufacture of aniline dyes from coal-tar products was not of great importance, there being at that time only five factories actively engaged in their manufacture, and only one engaged in the manufacture of an intermediate product, viz., aniline oil, and the production of these five factories was not nearly enough to furnish the American consumers sufficient quantities for their consumption.

It will be noted, after a careful reading of these articles and addresses, that at the present time, say April 1st, 1917, there has been so large an increase in the manufacture of coal-tar products in the United States that I now have a list of nearly 120 firms engaged in the manufacture of or dealing in coal-tar products, including derivatives, intermediate products and aniline colors, and the combined production of these factories equal the full consumption of these products in the United States, for all of what I might call necessary colors. The only exception to this statement are a few specialties which have not yet been produced by American manufacturers for the reason that the consumption of the individual products was not large enough to warrant taking them up until the more largely consumed colors had been produced, and now that this has been accomplished, it is only a question of a short time before all the colors which will be needed or desired here will be manufactured here, and this is a statement made with the positive knowledge of what is still in contemplation as to the manufacture of colors which have not been made here.

To accomplish the remarkable results as mentioned above, viz., to reach the point where sufficient colors are produced here, both as to quality and quantity, to furnish the total consumption, it is first necessary to recover from the coal-tar such derivatives as benzol and naphthaline, which are practically the main raw materials for all colors, in enough quantities to provide for the manufacture of the so-called intermediates, from which the finished colors are made, and this has been done, in that the production of benzol and naphthaline is now enough to meet every demand.

It being now admitted that the production and manufacture of coal-tar products is being successfully carried on on a large scale, the next question is whether or not this will be a permanent industry, or whether Europe will again recover a large part of the consumption here, and again have practically a monopoly of the American business, and I can again state, to my best belief and almost positively, that the industry will be permanent; briefly for the reasons mentioned in my address before the Textile Club on March 3rd, 1917, viz.: First, the sufficient production of benzol, naphthaline and other necessary raw materials; second, the additional tariff protection afforded after the war by the United States Government; third, the almost complete manufacture of intermediates made from benzol, naphthaline, etc.; and fourth, the necessity which American consumers have found since the war of having this industry in the United States, and their willingness to work with us and give us their preference for the colors used in their consumption, which is in itself one of the most valuable points in the permanency of the industry.

SUPPLEMENT

CULMINATION

Amalgamation of Coal Tar Chemical and Dyestuff Manufacturers in One Great Company Working as a Unit

National Aniline and Chemical Company, Inc.

EDITORIAL

Taking the First Steps Toward the Establishment of a Permanent American Dyestuff Industry

(Oil Paint and Drug Reporter, April 16, 1917)

When Director Ralph of the Federal Bureau of Engraving and Printing expressed his anxiety to obtain from American manufacturers of coal-tar colors a supply to carry on the work of his bureau, sufficient interest was aroused among the chemists of the country, and particularly at the convention of the American Chemical Society, then in session, to consider the matter of co-operating with the government in the provision of such dyes.

At this meeting the establishment of the American dyestuff industry upon a permanent basis was thoroughly discussed, and in it, consideration of the Norton dyestuff census, first published in essential detail in the Reporter, took no small part.

Yet, valuable time has been allowed to elapse without concerted action on the part of the chemists, and the country in the meantime has passed from the category of neutrals to that of the active combatants. In its issue of November 27 the Reporter asked:—

> "Are not the chemists and dyemakers of this country interested in supplying the demands of this government bureau?
>
> "Are they content to allow a still further continuance of a state of affairs which necessitate the petitioning of a foreign power for permission to import needed materials for government use?
>
> "With an increase in production in this country to a present-day total of 27,000 tons of aniline colors it would seem within the bounds of possibility that some

> steps should be taken at once to do away with such humiliating conditions as Director Ralph's action in turning to Germany fully bear out."

The first step toward the unification of the dyestuffs industry of this country was taken during the past week—an effort to establish upon a permanent footing a self-contained productive industry, from the coal base to the finished coal-tar color, through the production of coke-oven by-products, acids and intermediates, without recourse to foreign laboratories. The concerns thus co-operating are not competitive, but each produces one or more of the components entering into coal-tar color manufacture, or the finished aniline colors complete. The weight of the consolidation, for combination it is not, is such that it already produces about 50 per cent. of the coal-tar colors of commerce ordinarily used in this country, including 75 per cent. of the sulphur black.

With the capital available, and with the economic centralization of laboratory and productive effort possible in such an amalgamation as that proposed, there is a distinct promise of permanent achievement on the part of the American dye maker which augurs well, not alone for the production of the complete list of commercial colors demanded by American industries, but for the erection of a trade bulwark against the encroachments of foreign color manufacturers when the war shall end—as eventually it must.

If the present war has taught any single lesson to the American producer and consumer in any line of commercial endeavor it has been that of preparedness—the necessity of providing sources of supply within our own borders, of developing our productive capacity, or of creating new methods and new production.

The first steps toward an adequate American dyestuff industry have been taken by one group of producers. Subsequent similar steps by other groups will, no doubt, follow. And, in this business preparedness measure by business men there is more of hope and more of certain achievement than in all the resolutions of all the organizations which have considered the problem.

This is true business preparedness—the completion of a definite program of action for intensive production in a competitive field during a period of temporary inactivity on the part of competitors outside the nation, that the world competition sure to come may be met systematically, economically, completely, when the temporary bars to destructive rivalry by foreign producers of similar lines shall have been removed.

$20,000,000 Dyestuff Consolidation to Meet Foreign Competition After War

National Aniline and Chemical Company, Inc., to Include Schoellkopf Aniline and Chemical Works, Inc., the W. Beckers Aniline and Chemical Works and Benzol Products Company, With Sections of Barrett, Semet-Solvay and General Chemical Company Plants.

(Oil, Paint and Drug Reporter, April 16, 1917.)

The first step has been taken toward the mobilization of all the factors entering into the creation of an American dyestuffs industry to insure its permanency and to meet upon more approximately even terms the business competition with foreign dyestuffs manufacturers, which must result inevitably at the close of the present war.

Just as the outbreak of European hostilities cut off from this country the so-called intermediates from which a few American producers made aniline colors in this country, so will the cessation of hostilities open the way to a flood of finished colors from those countries, which have been, in the interim, utilizing their dye plants for the manufacture of high explosives.

The coal-tar color and chemical industries of this country have now agreed upon a form of amalgamation, not by any means a trust or combination in the accepted sense of the word, but a centralization of productive effort and of capital, utilizing the sources of supply, the mines, coke oven by-product plants, manufacture of intermediates and acids, etc., with the sole purpose of meeting the post-bellum competition with a united front and with the strength of resource which can be found alone in such industrial cooperation.

The Amalgamated company—which will be known as the National Aniline and Chemical Company, Inc.—will have among its executives J. F. and C. P. Hugo Schoellkopf, of the Schoellkopf Aniline and Chemical Works; I. Frank Stone, president National Aniline and Chemical Company, and Dr. William Beckers, of the W. Beckers Aniline and Chemical Works, and will control the entire works of the Schoellkopf Aniline and Chemical Works, Inc., of Buffalo, the W. Beckers Aniline and Chemical Works of Brooklyn, the Benzol Products Company, of Marcus Hook, Pa., and such sections of the plants of the Semet-Solvay Company of Syracuse, the Barrett Company works at Frankfort, Pa., the General Chemical Company of New York, and other factories, which produce those coal-tar intermediates entering into the manufacture of the finished colors.

The entire business of this new amalgamation will be under the control and known by the name of the National Aniline and Chemical Company, Inc., and the present company bearing that name of which Mr. Stone has been president since its formation will be reorganized. The executives will include those already associated with the companies entering into the new productive alliance, together with such new research and manufacturing chemists and other experts as shall be necessary to the carrying out of the plans for such a nationalization of dyestuff production as is contemplated..

A study of the output of the several companies entering into the new association shows that the Schoellkopf and Beckers companies are manufacturers of dyestuffs, the Benzol company aniline oils, salts and certain intermediates, while the General Chemical, Semet-Solvay and the Barrett company production entering into the plans of the new organization is in the line of coal, coke oven by-products and intermediates.

At the present time the Schoellkopf Aniline and Chemical Company is the largest manufacturer of coal-tar dyestuffs in this country. Prior to the war this company made about 10 per cent. of the colors used here from German-produced intermediates, about 140 out of 900 to 1,000 of the finished aniline colors of commerce.

Prior to the war, also, there were four other makers of colors in the United States, using the German intermediates as bases, and they produced about 10 per cent. of the colors of commerce. Since the war the Schoellkopf business has increased marvelously with the manufacture in this country of certain intermediates, and from their normal output before the war the business has grown to approximately ten times the ante-bellum production.

The Beckers business was inaugurated on a small scale in 1912—two years before the war. In January, 1915, the present company was formed, and since that time the business has increased largely and is now second in size in the country. In other words, the combined output of the Schoellkopf and the Beckers concerns is about 75 per cent. of the aniline color production of the country. It is interesting to note, however, that the lines are not competitives to any extent, since the Beckers colors are successfully employed in the woolen trade, while the Schoellkopf Company has specialized more in cotton, silk, leather, paper colors, etc.

The Beckers company bought the Standard Aniline Company recently, the second producers of sulphur black in the country in point of output. The Schoellkopf company leads the country in sulphur black production and the combined output of both concerns totals about 75 per cent. of the total production today. The competition from other makers in this line is increasing steadily, however.

There is another interesting factor in the color production of the Schoellkopf and Beckers companies. While the number of such colors produced prior to the war was about 150, this has now been considerably reduced, primarily because of a lack of those intermediates not yet made in this country. The Beckers company produces about 50 colors, and it will be noted that the total by the two companies is but 115, or about 50 per cent. of the 250 or so colors of commerce which will re-enter American consumption soon after the close of hostilities.

The Benzol company is the only branch of the new organization manufacturing aniline oils and salts, of which it is the principal producer in this country. With the expansion of its modern plant on the Delaware River it has increased its output to a large extent and has now begun the manufacture of various intermediates and is experimenting with the production of others. This business had its inception before the war and was the result of antebellum demands. It is owned equally by the General Chemical Company, the Semet-Solvay Company and The Barrett Company, makers of acids and of benzol and other coal-tar distillates, respectively. There is marked competition in these lines of production, for there are many makers of acids in quantity, and there are other producers of large quantities of coal-tar distillates.

As an indication of the policy of the new organization, it is stated that no agreements have been entered into with the three concerns last mentioned for the supplies of raw materials produced, since the amalgation will be free to buy supplies in the open market just as the other companies will be free to sell to other color makers.

One of the best evidences that the new association will not enjoy a monopoly—the first cry raised whenever the exigencies of business demand a conservation of supply and productive effort, although in this instance the conservation is for the interests of the dye industry as a whole against the united effort of foreign competitors when the war-time embargo shall again be lifted—is the fact that some 35 manufacturers of aniline colors in this country, many of whom are among the best-known among the concerns coming to the fore with the demand for increased production following war-time scarcity of coal-tar colors.

In addition to its purpose of placing the color industry of this country upon a more permanent basis, this proposed $20,000,000 consolidation offers the opportunity through plant production possibilities, the availability of acids, bases and intermediates, the laboratory facilities to be provided and the economic advantages due to centralization of production and marketing effort for the rapid development of production until they shall be prepared to market all the colors necessary to meet the demands, instead of about one-half the varieties as at present. In addition the organization will also produce pharmaceutical and photographic chemicals and explosives, as a natural development of their production of coal-tar products.

This possible development can be attained only through some such co-operative effort, and in itself will assure a welcome to the new enterprise.

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